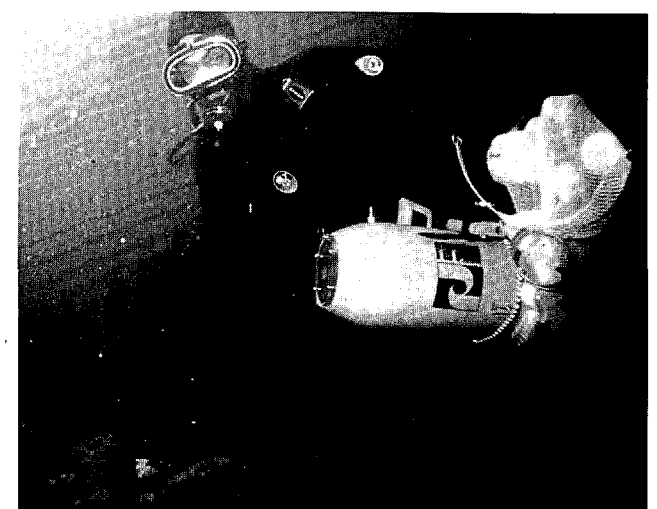
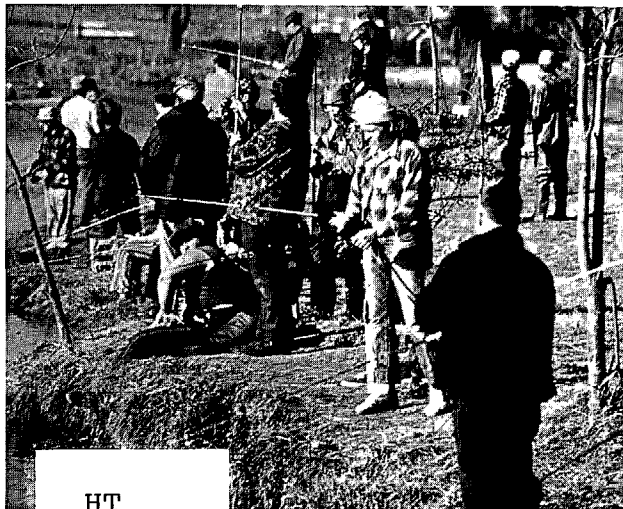
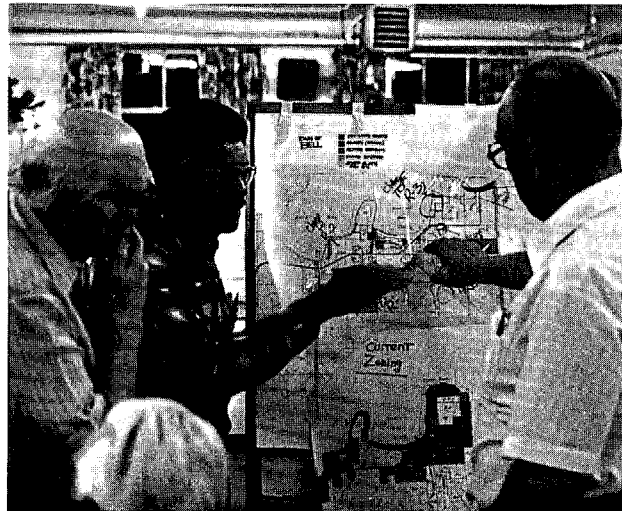


REPORT OF ACTIVITIES 1979



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WISCONSIN COASTAL MANAGEMENT PROGRAM

1979 Wisconsin Coastal Management Council

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Lee Sherman Dreyfus
Governor

State of Wisconsin \ COASTAL MANAGEMENT COUNCIL



c/o Room B-130
1 West Wilson Street
Madison, Wisconsin 53702

December 15, 1979

The Honorable Lee Sherman Dreyfus
Governor of the State of Wisconsin
115 East State Capitol
Madison, WI 53702

Dear Governor Dreyfus:

It is my pleasure to present the Wisconsin Coastal Management Program's Report of Activities--1979.

This report, the first since Coastal Management was adopted as a program of the State of Wisconsin in 1977, describes the program's many and varied accomplishments brought about through the enthusiastic participation of citizens and officials throughout the coastal counties and state government.

When discussion regarding Coastal Management for Wisconsin began nearly five years ago, it was determined that such a program should be effective, yet involving the participation of all affected parties; progressive, yet building on the better implementation of existing laws; and open and honest in the tradition of Wisconsin government.

I know that I speak for the other members of the Coastal Management Council when I proudly report that, in our estimation, the program has achieved those expectations. Small investments in the program, its projects, and in policy development are now multiplying to yield large returns.

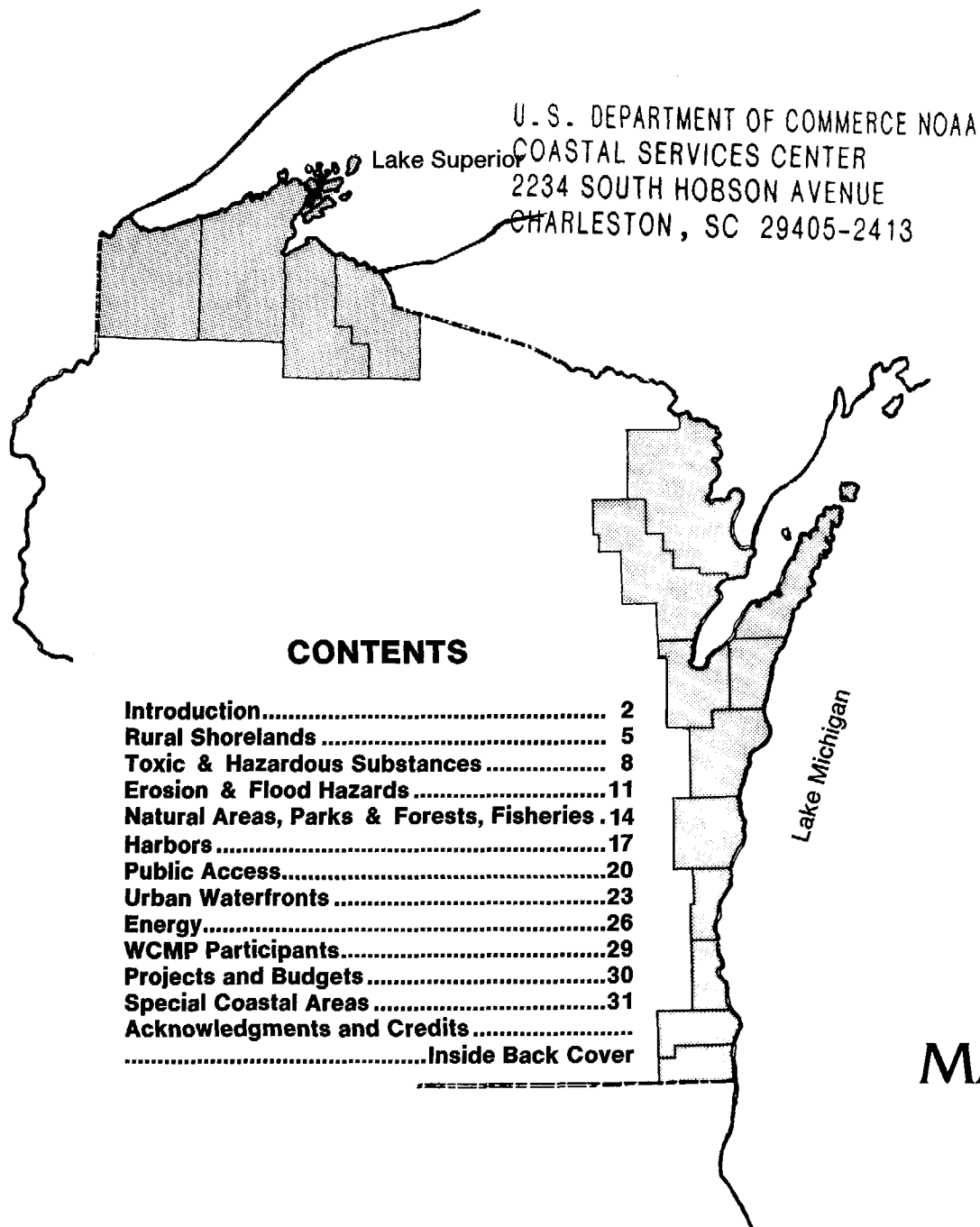
It is in this spirit of optimism and enthusiasm for the future of the program and Wisconsin's Great Lakes coastal resources that I submit this record of the Wisconsin Coastal Management Program to you and to the citizens of our state.

Sincerely,

Harvey Grasse, Chairman
Wisconsin Coastal Management Council

HG/cal

REPORT OF ACTIVITIES 1979



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WISCONSIN COASTAL MANAGEMENT PROGRAM

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INTRODUCTION

*"To me the sea is a continual miracle,
The fishes that swim—the rocks—the
motion of the waves—the ships with
men in them.
What stranger miracles are there?"*

W. Whitman, *Miracles*

One million years ago, they did not exist. Today, it would be difficult for us to exist without them. They provide food, water, recreation, and commerce. With magic allure, they draw us toward them.

They are the Great Lakes—Superior, Michigan, Huron, Erie, and Ontario—nearly 95,000 square miles of inland ocean, the largest group of fresh-water lakes in the world.

Wisconsin's 820 miles of Lake Superior and Lake Michigan coast exert a tremendous influence—and drawing power—on the people of the state and region.

Forty-three percent of the state's population lives along the coast. Lake-related commerce, from the large international ports at Superior and Milwaukee to the popular playgrounds of Door and Bayfield Counties, contribute mightily to the state economy. Residents and visitors alike live, work, and play on the shoreline.

But our attraction to the Great Lakes coast has caused problems—serious problems which are growing worse. Among them:

- Development in shore areas subject to erosion hazards
- Environmental degradation including toxic contamination and the destruction of wetlands
- Congested public recreational access and lack of adequate facilities
- Urban waterfront conflicts and misuse

In recent years, as people pressures have intensified along Wisconsin's shores, it has become apparent that the coast is not only a blessing, but also a responsibility.

Developing a Program

Two groups were formed in 1974 to fashion the Wisconsin Coastal Management Program: a gubernatorially-appointed Coastal Coordinating and Advisory Council involving legislators, local officials, and representatives of state agencies; and an independent Citizens Advisory Committee. Between 1974 and 1977, some 150 citizens and officials became directly involved in drafting the Wisconsin Coastal Management Program (WCMP).

The Coastal Coordinating and Advisory Council launched a massive public participation effort in the fall of 1976 to elicit the views of citizens. Questionnaires were circulated and 14 public meetings were held to gather citizen input—prior to the drafting of the WCMP proposal. Using this input, the Coordinating and Advisory Council then developed a proposal, sent it to another round of public review, and recommended gubernatorial adoption and submittal for federal approval in 1977.

The Wisconsin proposal was unique—so unique that federal officials reviewing the program under the Coastal Zone Management Act of 1972 almost



Wisconsin has 820 miles of Great Lakes coast

balked at funding it. The WCMP called for no new legislation and no new superagency to regulate the coast. Rather, citing the State's long tradition of strong home rule as well as progressive environmental legislation, Wisconsin approved a program to:

- Improve enforcement of existing laws;
- Streamline existing bureaucracy;
- Provide seed money to help get citizen and government management initiatives off the ground; and
- Recommend improvements in the existing state and local management of coastal resources.

Program Outline

The WCMP seeks to preserve, protect, and wisely develop the state's coastal resources for this and succeeding generations. The program focuses its efforts on special coastal areas and key uses of coastal land and water resources.

The WCMP addresses eight basic issues:

- Coastal water and air quality;
- Coastal natural areas, wildlife habitat, and fisheries;
- Coastal erosion and flood hazards;
- Community development;



Citizens become involved in the management of coastal resources

- Economic development;
- Energy impacts;
- Governmental coordination; and
- Public involvement.

The WCMP has five overall objectives:

- Improving the implementation and enforcement of existing policies and programs affecting key coastal uses and designated areas;
- Coordination of existing policies and activities;
- Strengthening local government capabilities to initiate and continue effective coastal management;
- Advocacy of the wise and balanced use of the coastal environment; and
- Increasing public awareness of the coasts and opportunities for citizen participation in coastal decision-making.

A 29-member Wisconsin Coastal Management Council, created by Executive Order, headed the program through the first years of implementation. Members include local, state, and tribal officials;

legislators; university representatives; and citizens.

A Council-appointed Citizens Advisory Committee monitored initial program implementation and provided counsel on public participation and education efforts. Each of the three coastal regional planning commissions maintained a citizen and/or technical advisory task force.

Evolution

The year 1979 capped the continuing evolution of the WCMP since adoption of the program by the state two years earlier.

Following a hard look at the program's philosophy and performance, Governor Lee Sherman Dreyfus reaffirmed the State's commitment to manage its coastal resources. The Governor's vote of confidence created a revised Coastal Management Council, currently being appointed, which maintains the state-local government partnership in coastal management.

Performance

The Wisconsin Coastal Management Council used three major tools, in addition to staff coordination of related programs, to implement the WCMP during the first two years:

- Distribution of grant funds to coastal projects;
- Designation of special coastal areas; and
- Recommendation of improvements in state management of coastal resources.

In 1978-79, the WCMP used \$1.4 million in federal funds, matched by more than \$400,000 in state and local money, to support 72 projects ranging from port promotion in Superior and Milwaukee to fisheries and natural area preservation studies, park planning, and increased enforcement of zoning laws.

In the current 1979-80 grant year, the program allocated nearly \$1.9 million from federal, state, and local sources to more than 40 projects. New initiatives included: a comprehensive survey of toxic substances in Great Lakes fish; a public access and erosion management study in Milwaukee County; and development of land use ordinances for erosion hazard areas.

Over 95 special coastal areas (SCAs) were designated by the Council. These areas contain important and unique natural, scientific, recreational, historic, economic resources; areas of high erosion hazard; and approved sites of future power plants. Upon designation, the Council entered into an agreement with the respective state or local agency to guarantee that the area will be managed according to agreed upon policies.

Streamline the water regulation permit review process. Provide public funds for shore erosion protection only if there are commensurate public benefits. Year-round navigation, as proposed, should not be supported by Wisconsin. The state needs to provide coordination and assistance to community harbor dredging efforts. These are but a few of the Council's recommendations for improving state and local management of coastal resources.



Jim Purinton Photo

To preserve, protect, and wisely develop Wisconsin's coastal resources . . .



RURAL SHORELANDS

*"By the shores of Gitchee
Gumee . . .
Beat the clear and sunny water,
Beat the shining Big Sea Water"*

H. Longfellow, *Hiawatha*

Wisconsin's Great Lakes coasts are undergoing transformation. The majority of the State's shoreline is still undeveloped—50 % overall and nearly three quarters of Lake Superior. But people pressures are demanding more and more prime lake-shore property for homes, businesses, and industry.

Over 80 % of the coast in southeastern Wisconsin is already filled with urban and residential development. More than half of the State's shores along Green Bay and northern Lake Michigan are either urbanized or have nonagricultural rural development.

Not that development is inherently bad at all times in all places. But uncontrolled and unwise development has historically led to increased water pollution, destruction of shore cover and natural beauty, acceleration of shore erosion, destruction of fish spawning grounds and wildlife habitat, and a host of other environmental and recreational access problems.



Most shoreland zoning ordinances did not consider coastal erosion conditions

Shoreland Management

In 1966, the Wisconsin legislature passed a comprehensive state law to control shoreland development problems. All counties in the state have adopted shoreland zoning, subdivision controls, and sanitary codes which apply to all lands within 1,000 feet of a lake or 300 feet of a stream in unincorporated areas. On the coast, this includes the shoreline of 14 of the 15 coastal counties.

DNR Technical Assistance in Floodplain-Shoreland Matters, a WCMP project now in its second year, sought to improve the agency's implementation of the state shoreland and floodplain management laws as applied to the coast. The objectives of the project were to increase contact and assistance to county programs, provide training of local officials in the law and its administration, and improve ordinance sensitivity to the unique problems of the Great Lakes.

Prior to initiation of the project, the Department of Natural Resources admittedly had insufficient staff to conduct effective monitoring of county pro-

grams, to resolve administrative difficulties, and to assist in prosecution of violators. To date, all coastal county programs have been inventoried and several contacts have been made with each county to discuss areas of needed assistance. In addition, WCMP-funded water regulatory personnel in each district have spent a portion of their time monitoring floodplain-shoreland amendments, variances, and special exceptions.

Training sessions for county zoning administrators, district attorneys, boards of adjustment and planning and zoning committees have begun. The 1979 Wisconsin County Code Administrators spring conference featured a special session on coastal problems for zoning administrators. Additional sessions with other professionals are planned and a shoreland-floodplain guidebook has been developed. Additional educational materials and methods have been put together as a result of another WCMP project, UW-Extension's Training for Local Resource Professionals.

Prior to initiation of the project, few Great Lakes shoreland zoning ordinances gave special consideration to coastal shore erosion concerns. While inland lakes and streams also have shore problems, they are not caused by forces nearly as powerful as the Great Lakes. For example, 13 foot waves strong enough to move a large concrete block weighing 2600 tons can be expected off Milwaukee about once a year.

Coastal shoreland ordinances have now been examined, and many local officials are interested in revising the ordinances to reflect the special coastal conditions. These conditions are described in other WCMP supported studies which document the nature and extent of shore erosion along the coast. Future WCMP efforts also include development of model ordinance provisions to cope with shore erosion problems.

In part through these efforts, Douglas County on Lake Superior recently became the first county to update its shoreland zoning ordinance to reflect the special coastal erosion conditions.

Water Regulation

Wise construction on the coast sometimes means protecting the lakes from people as well as people from the lakes. Wisconsin has regulatory programs covering such activities as dredging and building docks.

However, along Wisconsin's coast, where there is a considerable amount of construction activity, regulations weren't always enforced. And water regulations aren't much good if they aren't enforced.

In order to provide better enforcement, the WCMP agreed to support a two-year demonstration of additional water regulatory staff in each of three DNR coastal district offices.



Improved permitting should prevent unwise or illegal shoreline structures

James G. Rosenbaum Photo

So far, the biggest improvement has been reduction in the time it takes a citizen to get a permit for a water-related construction project. In the Marinette district office, that processing period has been cut from 60 to 16 days.

That's good news for both the permit applicants and their neighbors. Many times in the past, people would get tired of waiting for permit approval and go ahead with the building of illegal and often unwise structures, or with filling operations. Frequently such projects meant more problems for neighbors down the coast where erosion would be accelerated.

The three new investigators have also been able to assist local governments in their jobs of enforcing shoreland and floodplain regulations. Newly permitted projects have also been inspected to assess environmental effects and to make sure they are being done according to state law. Surveillance and investigation of unauthorized projects have also increased.

At the end of the two year project, the impact of the additional staff will be thoroughly evaluated. If the experiment continues to be successful, it may inspire the permanent hiring of additional district staff.

Town Projects

Two rural coastal towns received WCMP assistance to deal with their particular problems.

The Town of Lakeside in Douglas County evaluated management policies available to the town to control population growth, economy, transportation, housing, and special coastal conditions. The resulting policy plan has since been adopted and paved the way for Douglas County's update of the shoreland zoning ordinance.

In a letter to the Coastal Management Council, Eugene Davidson, Lakeside Town Chairman, stated that his town formed a committee of residents to

Jim Purinton Photo



Management of rural shorelands can prevent future problems

work on the project. "This local input of citizens and town officials has helped to promote a bond between the town, the WCMP Task Force, and the Council. Without local input, there will be no CMP in Wisconsin."

In Door County, the Town of Nasawaupee prepared a shoreline inventory and land use plan which included the identification of a bulkhead line. A bulkhead line establishes the legal boundaries between private shoreland and public jurisdiction of the lake. Rapidly developing areas like Nasawaupee find bulkhead lines advantageous because they tell the local property owner just where he can or cannot conduct filling operations or build a structure without a permit.

Although the proposed bulkhead line has not yet been adopted by the Town, a remarkable blend of multi-level governmental cooperation brought it this far. The U.S. Army Corps of Engineers, the

U.S. Fish & Wildlife Service, the Wisconsin Department of Natural Resources, and Nasawaupee officials all got together to agree in concept where the bulkhead line should be along the lakeshore.

Eventual bulkhead line establishment should clarify legal recognition of public ownership of low-lying shore areas along the town's coast. It should also slow down eutrophication of the wetlands and prevent further encroachment into ecologically sensitive Sawyer Harbor.

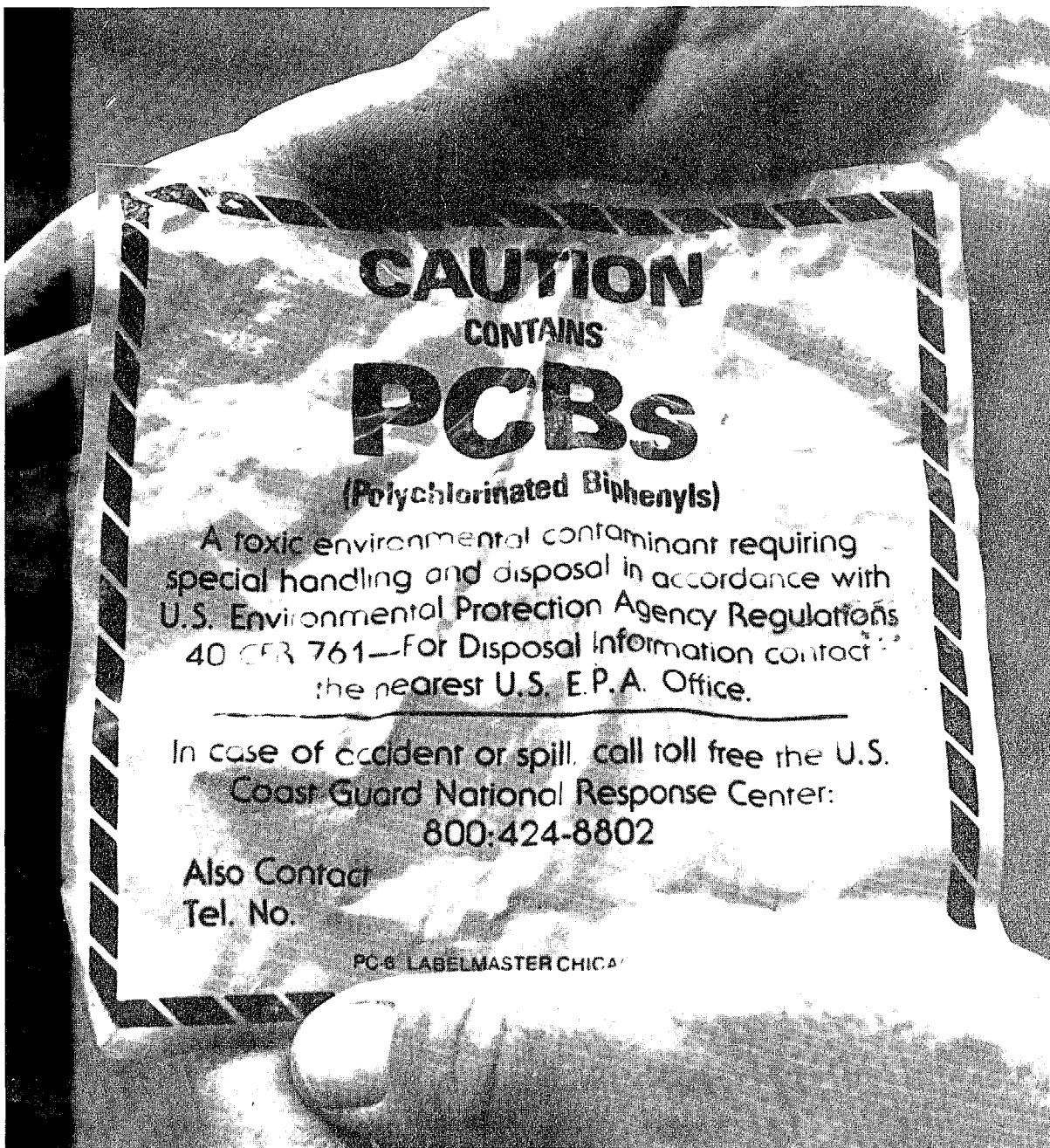
Tribal Lands

Together, the Red Cliff and Bad River Bands of the Lake Superior Chippewa control nearly one-third of Wisconsin's Lake Superior coast. Through a desire for cooperation expressed early in the development of the WCMP, Wisconsin's program is one of the few to have developed rapport with the sovereign Indian people.

Through a special grant made available to only Great Lakes tribes, the Red Cliff began a two-year project to work on ordinance development and code enforcement for the protection of tribal coastal resources. To date, updated shoreland management and conservation codes have been drafted for tribal review, and a tribal enforcement and judicial system has been investigated.

The Bad River project had the objective to establish proper fish and game controls and to enhance their walleye hatchery operation. The tribe drafted conservation codes and improved the hatchery operation through purchase of equipment and technical assistance in fish handling techniques.

Although tribes are not required to cooperate with state coastal management programs, Red Cliff Tribal Planner Harry Jensen attributes the cooperative working relationship to common purpose. "There's not much room for argument. The goals are pretty well matched. And the program has really given us an opportunity that wasn't there before."



TOXIC AND HAZARDOUS SUBSTANCES

"Water, water everywhere. Nor any drop to drink."

Coleridge, *Rime of the Ancient Mariner*

No right-minded person would intentionally contaminate his own drinking water or dump poison into his food. Yet Great Lakes residents, communities, industries, have used the Great Lakes—intentionally or unintentionally—as a disposal for toxic and hazardous wastes in spite of the fact that the lakes are a source of drinking water and food for hundreds of thousands of people.

Robert Sugarman, U.S. head of the International Joint Commission, recently announced that unless we act decisively and quickly, we can write off the lower Great Lakes as a source of food and water. The upper Great Lakes—Superior, Michigan, and Huron—are not far behind.

It is now hazardous to eat more than one meal a week of two of the most popular Lake Michigan sport fish—lake trout and salmon—because of high levels of PCBs (polychlorinated biphenyls) found in the fish. Pregnant and lactating women are warned not to eat any of the fish at all. A highly

toxic substance manufactured between 1929 and 1977, PCBs have been found to cause cancer in animals.

PCBs accumulate in fish after making their way into the lakes in runoff, sewage, industrial wastes, and air pollution. Most large fish in the lake now contain more than the 5 parts per million limit currently recommended for human consumption. Although the manufacture, use, and distribution of PCBs is now outlawed, experts predict that the substance will remain in the lake ecosystem at hazardous levels for at least a decade.

The effect of municipal sewage effluent on drinking water from Lake Michigan is also a source of concern. A number of Wisconsin communities and industrial plants use the lake or one of its tributaries as the depository for their wastes. The City of Milwaukee, for example, has dumped raw sewage into Lake Michigan during heavy rainfalls when the capacity of treatment facilities has been surpassed. Sued by the City of Chicago, which claimed the wastes eventually were swept down the Illinois coast, Milwaukee now is undertaking an expensive public works project to upgrade the sewerage treatment facilities.

Despite these problems, several Wisconsin communities—including Cudahy, Green Bay, Kenosha, Manitowoc, Milwaukee, North Shore, Oak Creek, Port Washington, Racine, Sheboygan, South Milwaukee and Two Rivers—draw their drinking water from Lake Michigan.

Pollution has reached levels critical enough to force beach closings in some cities. Green Bay was forced to close one of its public beaches permanently several years ago to keep people from swimming in polluted water. These incidents have made the poisoning of the lakes an issue of major concern to Wisconsin citizens. In a WCMP questionnaire circulated statewide in 1976, water pollution was the No. 1 concern cited by citizens.



High PCB levels in the Sheboygan River made the need for a comprehensive survey uncomfortably clear

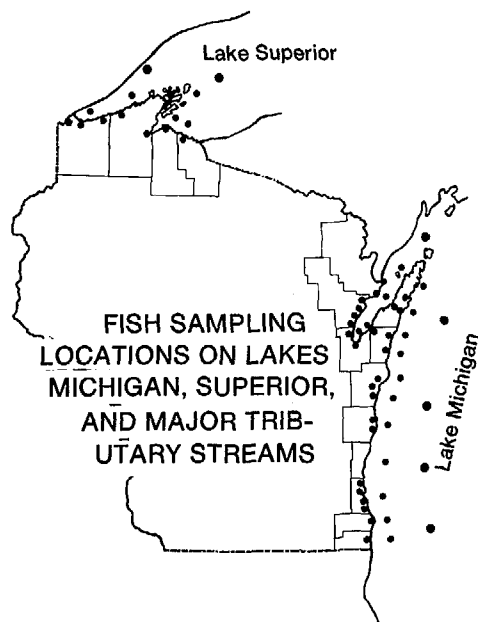
Toxic and Hazardous Substances Survey

Chemicals in Lake Michigan and Lake Superior are nothing new. While we've been aware of isolated problems for quite some time, the state has never made a comprehensive study of the scope of toxic contamination in Lakes Michigan and Superior and their tributary streams. Now, thanks for a \$118,000 grant from the Wisconsin Coastal Management Program, the Department of Natural Resources will try to get a more complete picture of the overall problem.

PCBs (polychlorinated biphenyls) are considered the villains in most minds; but this new study will look for 15 other hazardous substances as well. Dr. Thomas Sheffy, DNR chemist and project coordinator, states that one of the primary goals of the study will be to identify which tributary streams are contaminated with toxic wastes.

"We really don't have a complete record of which tributary streams have high PCB levels," he observes.

He will find out by taking fish samples from 60 locations on or near Wisconsin's Michigan-Superior



coast. Over half of those spots are one to two miles upstream in major tributaries of the two lakes. Twenty-one are nearshore locations 4 to 5 miles from the coast, where most commercial and sport fishing takes place. Finally, seven spots are offshore stations where Sheffy hopes to get an idea of the extent of toxic contamination in the lakes.

The benefits of this project will be wide ranging. After the DNR has evaluated the fish stock, commercial fishermen can be advised on which areas of the lake are the most likely to provide a high quality, uncontaminated catch. The sources of contamination will be more readily identifiable and corrective measures can be taken quickly. The public will be informed, through a variety of media, about potentially dangerous waterways and how to avoid them.

As Sheffy notes: "There is a possibility we could change the fish consumption advisory if we find a new problem area."

Earlier studies of water-based toxic contamination

in Wisconsin were primarily trouble-shooting affairs dealing with one particular crisis. In 1968, 1970, and 1978, surveys were made of pesticides and heavy metals in Wisconsin fish, but very few samples were taken on or near the Great Lakes. In 1978 extremely high levels of PCBs were found in fish from the Sheboygan River, and the need for a comprehensive, broadbased toxic study became uncomfortably apparent. The Wisconsin Coastal Management Program grant will enable the DNR to do just that. Sheffy expects to see the first fruits of this survey in June of 1980.

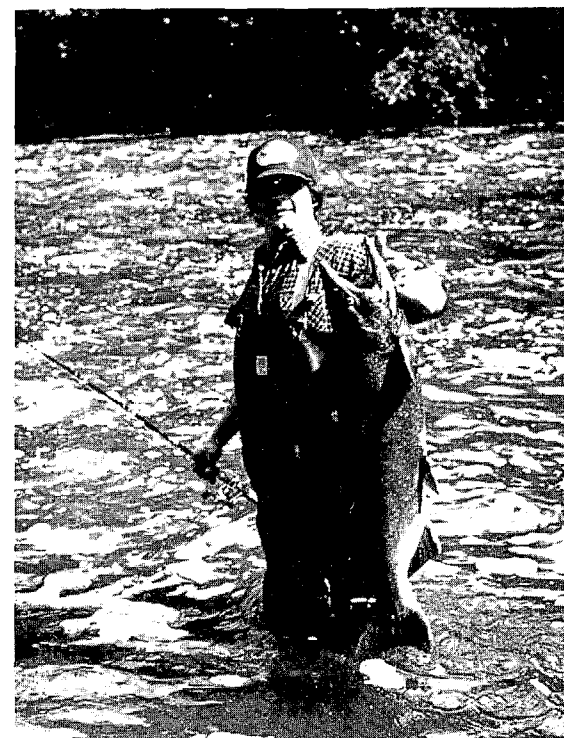
"I don't think we have mother-lodes of toxic substances that are going to kill people or devastate communities," says Sheffy. "But too many times we've reacted only after higher levels of poisons have been found. This survey might allow us to nip some problems in the bud."

Municipal Water Intakes

Another \$10,000 is being used by WCMP to learn more about drinking water dangers for Great Lakes communities. Are pollutants threatening water supplies? If so, what can be done about them? How do we make sure lakewater drinkers are protected by adequate warning systems in case toxic substances appear?

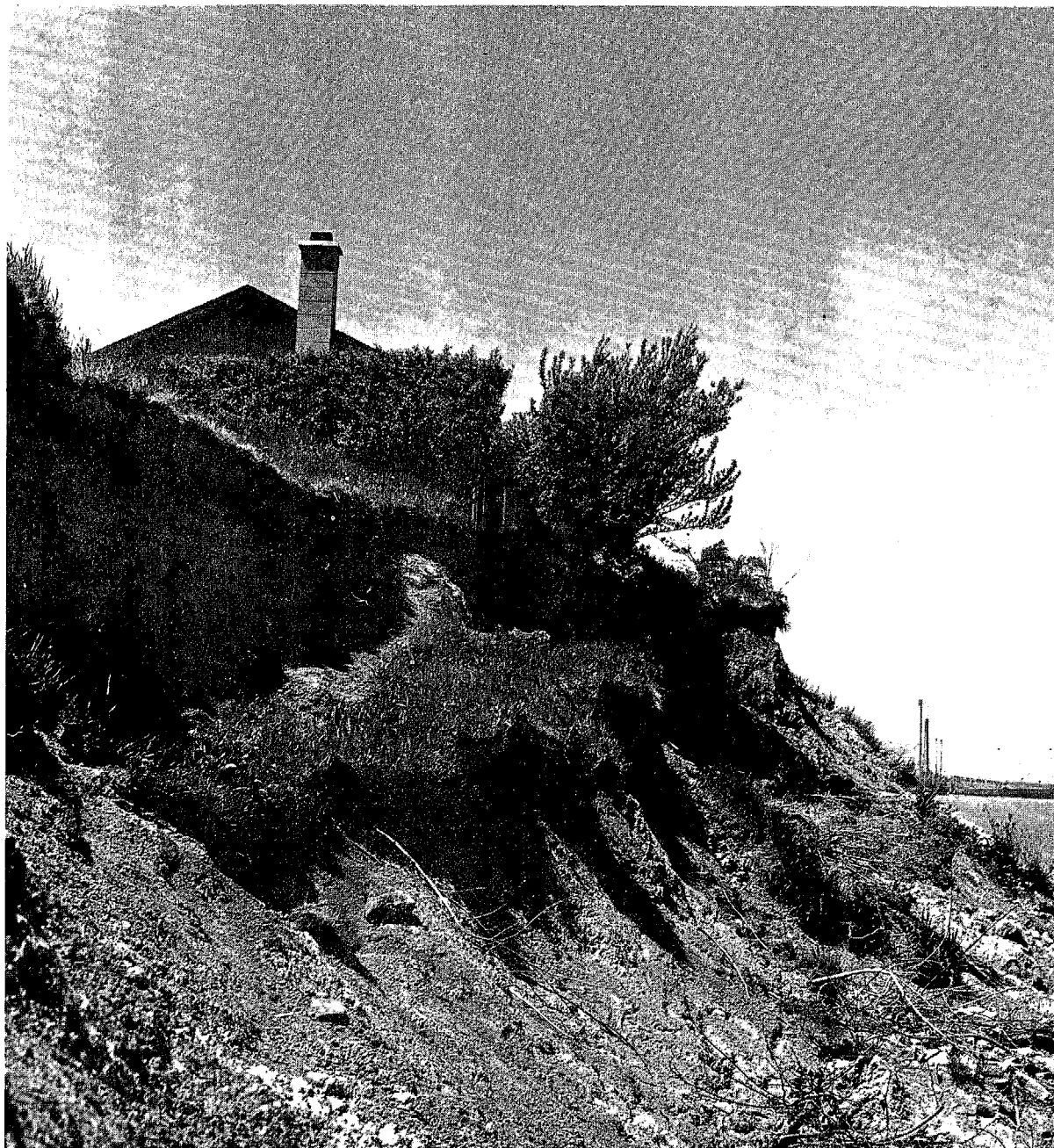
According to Phil Utic, general manager of the Green Bay Water Department and past chairman of the American Waterworks Association, there are several potential pollution sources which would cause trouble for Great Lakes water supplies—among them nuclear power plants, industrial and municipal wastes and spills from Great Lakes ships. The study, performed by a private firm, will analyze lake currents, winds, temperatures, level fluctuations and tributaries to find out how these factors influence the movement of pollutants. "We enjoy a good water supply from Lake Michigan," says Utic. "We'd like to make sure it stays that way."

Although Wisconsin has strong water quality laws, protecting the Great Lakes from poisons is no easy matter. In the interwoven ecosystem, even air pollution ends up as water pollution. Estimates are that 25 percent of all the particles in the air along the coasts end up in the lakes. PCBs vaporized or incinerated end up as "PCB rain," a poisonous atmospheric fallout contaminating the lakes. Other air pollutants produce "acid rain," already causing problems in some of the state's inland lakes. The poisoning of the lakes promises to be a problem of lasting concern for the state and region.



Toxic substances threaten sport and commercial fishing and water supplies.

DNR Photo



EROSION AND FLOOD HAZARDS

*"Roll on, thou deep and dark-blue
Ocean, roll!
Ten thousand fleets sweep over thee
in vain;
Man marks the earth with ruin, his control
Stops with the shore . . . "*

Byron, *Childe Harold*

The beauty and utility of the Great Lakes have inspired a great deal of coastal construction in Wisconsin. Municipalities, industries, small businesses, and homeowners have all been drawn to coastal locations. But, as the Biblical admonition warns, there are problems with building on sand.

According to the U.S. Army Corps of Engineers, the eroding action of the Great Lakes caused \$20 million in property damages in Wisconsin between 1972 and 1976. In some places, homes, businesses, and public facilities were jeopardized as the land on which they are located was eaten away. Trying to combat the problem, the government spent \$10 million in erosion control structures during the same four year period. Property owners themselves spend hundreds of thousands more.

Kenosha County's Carol Beach, the most critical erosion area along Wisconsin's Lake Michigan shore, has receded an estimated 1,200 feet in the

last 100 years. In Racine County, nearly 5 million cubic feet of bluff have been lost each year between 1968 and 1976. These kinds of statistics continue throughout the coast and translate into serious personal problems for shore property owners.

Government agencies and landowners have tried to deal with erosion by building erosion-control structures. But the structures are expensive (up to \$500 per linear foot of coast) and temporary.

Flooding is also a concern along the west and south shores of Green Bay. In the past, serious flooding has caused hazards to safety as well as property damage.

Wisconsin Shore Erosion Plan and Council Policy Recommendations

"The tool kit for dealing with shore erosion is quite large and varied," according to Stephen Born of the University of Wisconsin-Extension. "There are some innovative things you can do and there are some traditional approaches you sometimes must fall back on. But each particular solution needs to be tailor-made by the individual communities and riparians."

Born is co-author of *Wisconsin's Shore Erosion Plan: An Appraisal of Options and Strategies*. The report is the culmination of several years of WCMP efforts to understand the problems and process of shoreline erosion and to develop comprehensive public policy alternatives geared toward damage reduction.

Since the inception of the WCMP, coastal riparians and local officials have consistently ranked shore erosion as a top concern. Although public interest was high at that time, scientific understanding of Wisconsin's Great Lakes shore erosion problem was low.

As a result, the WCMP embarked on the multi-year effort, following the framework and timetable of the *Shore Erosion Study Plan* of 1974. During the



Racine County Coastwatch Photos

Coastwatch observers monitor shoreline changes

following few years, a wealth of geologic and other technical data was assembled by scientists from a number of state agencies and university departments.

The picture painted by these studies reinforced the basic premise that shore erosion is a complex, natural process which is difficult, if not impossible, to arrest. Damage reduction is attainable along the Great Lakes shoreline; effective, permanent erosion control is not.

The *Erosion Plan* lays out the two basic approaches to shore erosion damage reduction. Structural measures—erecting physical works like breakwaters, revetments, and seawalls—are very costly, sometimes ineffective or even detrimental if improperly designed or placed, and need frequent maintenance or replacement. They are, however, one of the few alternatives available to protect homes and other structures built too close to receding shores.

In undeveloped areas, non-structural solutions like setbacks and other land use regulations can be effective in reducing future erosion damages by precluding development in areas sure to erode during the life of the home or building. Application of

other non-structural techniques like acquisition, relocation and hazards disclosure can also minimize erosion damage.

Beginning in November, 1978, the Wisconsin Coastal Management Council moved the discussion one step further by addressing the question: What should the state and local government's role be in reducing shore erosion damages?

In late January, 1979, the Council adopted principles which stressed the use of preventative, non-structural solutions wherever possible. Further, public funds should only be applied to the extent that there would be commensurate public benefits.

By March, the Council requested the Department of Natural Resources to review administrative procedures for permitting shore structure construction. Erosion hazard public information and disclosure programs were outlined. Local governments were encouraged to map erosion hazard areas and update shoreland zoning ordinances accordingly.

The several years from problem identification to Council adoption of a recommended shore ero-

sion policy for the state was an arduous, exacting process. From data needs to policy analysis, the WCMP pursued an answer where no other state agency felt a responsibility.

Perhaps understanding the nature of Great Lakes shore erosion was as significant as formulating policy. For in the end, the policy stance of the Council merely respects what one WCMP project consultant calls "the power and presence of the lakes."

Coastwatch

Severe erosion of Lake Michigan bluffs in Racine County may be caused more by rainfall than by wave action, according to early data gathered by volunteer observers.

The observers, participants in the Racine County Coastwatch Program now in its second year of WCMP funding, have been collecting information about precipitation, wave height, period, and direction at 11 stations since September, 1978. Both daily and weekly information is recorded and referred for analysis to Phil Keillor, a coastal engineer with the UW Sea Grant Institute.

Most of the monitoring stations reported active erosion occurring with some bluffs receding as much as ten feet, according to Keillor. Although both waves and rainfall have had an effect, the data refutes the commonly-held hypothesis that high waves are the primary cause when the banks erode in huge chunks.

The Coastwatch Project promises to have important results for both Racine County and scientists. For one thing, it identifies how important ground water is in causing bluff recession in Racine County. The Racine County Planning and Zoning Department, local Coastwatch co-sponsor, should find the information helpful in planning sites that will not aggravate drainage into critical erosion areas.

According to Barbara Burke-Griffin, Coastwatch Director, "You *can* develop a program with volunteers and get good reliable information." All observers were trained before going to the shore with tape measures, rain gauges, cameras, and data sheets. While monitoring wasn't stressed during the severe winter months, the enthusiastic coastwatchers still made their daily observations 60 to 100% of the time.

The second year of the project should clarify and confirm the results of the first. If the present successful course is continued, Coastwatch should tie in nicely with other shore erosion research and may soon help Racine County deal with its receding coastline.

Brown County Floodplain Work

Floodplain management is the topic of two WCMP studies in Brown County. Both studies center on developing planning and enforcement tools necessary for intelligent floodplain management decisions.

Twenty detailed topographic maps of the Town of Suamico produced by the Brown County Shoreland-Sanitary Code Administrator's Office will enable the County to precisely determine the floodplain and delineate conservancy zones. The great accuracy and detail of the maps will make zoning regulation easier.

The maps have also been a real boon to local government agencies, including the county planning commission, the surveyor, and the county highway commission. Because the area is floodprone, developers have also taken an interest in the maps.

With these new maps, Brown County and the Town of Suamico have an invaluable tool for planning development and enforcing zoning. As Michael Casey, Assistant County Zoning Administrator noted, "When you get these maps, you wonder how you got by without them. They're really Cadillac stuff!"

A bit more fundamental is the work being done on the Duck and Trout Creeks by the Oneida Tribe. Detailed plans for the management of the floodplains within the reservation have been developed based on new surveys and existing data. As a direct result of the studies, zoning ordinances are being drafted which center more on resource preservation than its development.

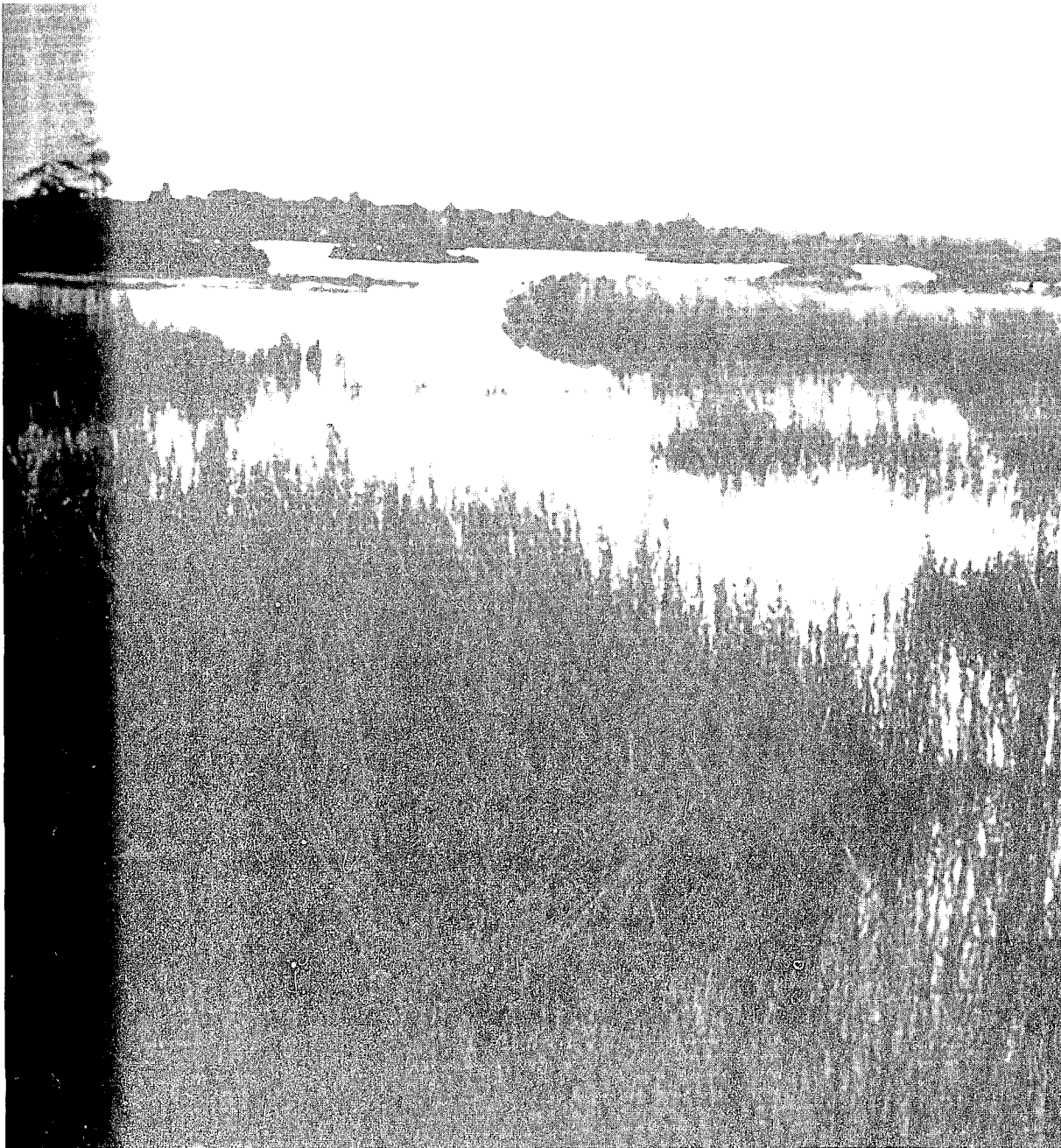
But according to Oneida Tribe Planner Carl Rasmussen, some development has already hurt the area. "Lot lines are going up to and through the creeks. No public recreation areas were considered."

The Oneida Tribe is marshalling all available resources at hand to protect the Duck and Trout Creek floodplains and manage their development. An unexpected byproduct of the Tribe's recent work was the discovery of two species of endangered and threatened turtles within the floodplain. With information like this, the Oneidas will be able to protect valuable wildlife habitat, as well as scenic and recreational areas as part of comprehensive floodplain management.



Flooding is a special concern in the southern Green Bay area

Oneida Tribe Photo



NATURAL AREAS, PARKS AND FORESTS, FISHERIES

"I can assure you I like noe country, as I have wherein we wintered; for what ever a man could desire was to be had in great plenty; viz. staggs, fishes in abundance . . ."

P. Radisson, 1650s

Wisconsin's landscape has experienced dramatic changes in the century and a half since intensive settlement began. Today, little remains of the original communities of plants and animals which formed in Wisconsin following the retreat of the last glaciers. Only scattered natural area sites have escaped white man's exploitation or have sufficiently recovered to show few traces of former disturbance.

Coastal natural areas, including forests, bluffs, sand dunes, fens, bogs, and marshland, are in increasingly tenuous positions. These remnants of a former ecosystem are benchmarks for assessing the impact of human activities. They also frequently provide important habitat for endangered or threatened animal species and can accommodate conservation and nature study education.

Wisconsin's Great Lakes coasts contain nearly 150 remaining natural areas, according to a 1976 WCMP inventory carried out by the Scientific Areas Preservation Council. Of the 49 natural area



Green Bay's West Shore contains most of the remaining wetlands on Wisconsin's coast

sites of statewide or greater significance, only 20 were protected as State Scientific Areas. Another 80 sites were found to still be extremely valuable as regional or local educational areas or environmental corridors. These were in various stages of protection or threat from development.

Coastal parks presently provide the majority of recreational facilities along Wisconsin's Great Lakes shoreline. One national lakeshore, 11 state parks, two state forests, many state fish and wildlife areas, and many local parks dot the shoreline. Even though these public recreation areas account for about 15% of the coast, projections show that these are inadequate to meet burgeoning public demand. Some areas need better facilities, other areas need to be enlarged, and still others need better management of crowds and facilities.

Wisconsin's Great Lakes fishery has had a checkered history plagued with drastic man-induced changes in fish populations. In recent years, the commercial fishing industry has been particularly hard hit by sea lamprey attacks and high levels of DDT and PCBs in Lake Michigan. Lake trout and other species, only beginning to recover from the sea lamprey problem, have now been rendered unmarketable due to PCB levels.

Presently, Great Lakes sport fishing is flourishing. Control of the sea lamprey, introduction of salmon, and extensive federal and state stocking programs have rejuvenated what was an ailing sport and industry. Toxic contamination, however, brings a specter of gloom to an otherwise rose-colored horizon.

Green Bay West Shore Wetlands

At one time the western shores of Green Bay were laced with 9,600 acres of marshes, rich in wildlife, and tempting to the early morning hunters who came over from the city of Green Bay.

But the pressure of economics and population took their toll on these "waste lands." By 1975, over 60 percent of these coastal marshes were lost to dredging or filling operations. With them went the ducks that used to feed on the wild rice, several other species of birds, and many of the fish that spawned there.

Even in their reduced state, however, the west shore marshes comprise most of the remaining wetlands on the Wisconsin shores of Lakes Michigan and Superior, and they continue to be attractive to wildlife.

To ensure that these remaining valuable lands are not lost to development, the Department of Natural Resources, working with a grant from the Wisconsin Coastal Management Program, has put together a plan identifying wildlife habitat areas.

According to Dan Olson, DNR area wildlife manager, the 10-year plan stresses the extreme importance of the marshes and how they relate to the quality of life in Green Bay.

"The public is beginning to realize the ecological values of the marshes," he says. "Not only do they support the wildlife, but they also sponge up potential floodwaters, filter run-off water before it runs into the bay, and provides prime recreation opportunities."

The west shore shelters two of only four known American colonies of the double-crested cormorant—on Wisconsin's endangered list. The endangered Forster's tern finds sanctuary here as do migrating whistling swans and mallards, blue-winged teal, Canada geese, and various shore birds like the snipe. Northern pike, perch, walleye pike, and small mouth bass spawn in the marshes.

Carol Cutshall, coastal planner for the Bay-Lake Regional Planning Commission, explains "We needed an acquisition plan. There's been so much destruction of wetlands here that it'll soon be too late to save any of them." She further notes that one benefit to the local communities will be the money saved; preserved lands will not need water and sewer systems.

While the DNR continues its plans to protect wildlife and fish habitat before conflicting land uses develop, the Bay-Lake Regional Planning Commission has proposed a complementary project.

Their plan is to coordinate various ongoing studies in the wetland areas with the assistance of a WCMP grant. Transportation, energy, economic development, and local concerns, as well as the wildlife and recreation values, will be examined and discussed. One outgrowth could be local zoning to protect critical areas—both an alternative and a complement to state land acquisition.

With state, local, and citizen cooperation, the last remaining coastal marshes can be spared.

Coastal Park Planning

The Wisconsin Coastal Management Program provided seed money to several coastal communities to aid in planning for development of coastal parks.

Racine County received \$34,000 to conduct four studies which will shape acquisition, development and erosion protection for Cliffside Park and adjacent Lake Michigan shorelands in the rapidly ur-

banizing Town of Caledonia just north of the City of Racine.

An inventory of the area found a diversity of ecosystems, some of which have unique regional features and which may contain rare or endangered species. The erosion study recommended a full

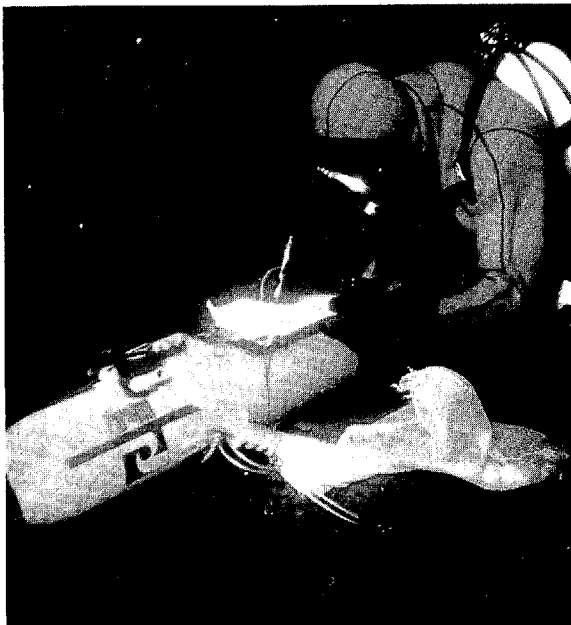
range of bluff toe and face protection, as well as bluff dewatering, for imperiled reaches of the shoreline. The feasibility of establishing emergency rescue access over the steep bluff edge was examined at three locations along the 2.5 miles of lakeshore. And with completion of a recreation activity planning effort, the package is now complete for county and town action.

Iron County received \$16,600 for three projects geared to increase public recreational access and use of the county's coastline. One project prepared site plan alternatives to address the recreational demands and physical and environmental characteristics of Saxon Harbor Park. A second investigated the location of the Flambeau Trail and associated historical resources near Saxon Harbor in order to identify the starting point of the famous trading route to Wisconsin's interior. A third provided a plan for the development of a limited use recreational corridor to Saxon Harbor from the major highway.

With a total grant of \$16,250 from the WCMP, the City of Ashland developed plans for a coastal trail along the city's waterfront; for the redevelopment of Prentice Park, the largest community park on Chequamegon Bay; and for the investigation of the removal of exposed and submerged piles which inhibit beneficial waterfront development.

The City of Bayfield rehabilitated its four city parks with a \$6,000 WCMP grant. And with a \$2,400 investment, a site plan was developed for enhancing the recreational use of the Clover Town Park, thus improving public access to Lake Superior.

UW Marine Studies Center Photo



Rehabilitating native trout fisheries is the goal of underwater surveys.

Great Lakes Reefs and Shoals

Lake trout were once hardy natives of Lake Michigan and the lake's foremost predators; today, the only lake trout in Lake Michigan are those put there through human effort.

With the help of a grant from the WCMP, scientists at the UW-Madison and the Department of Natural Resources are now probing for explanations for the trout's breeding failure.

They feel part of the answer may lie with the character of the sites where the fish—until recently—had been planted. Lake trout are thought to become imprinted to certain areas as young fish and then return to these specific areas, as adults, to spawn.

However, in the past, state and federal fish plant-

ings have involved dumping truck loads of fish at spots along the shore—off piers and jetties and near the mouths of rivers.

Scientists—among them the UW limnologist Ross Horrall—point out that conditions in those areas are not suitable for lake trout spawning, or for egg and fry survival.

Working under contract for the DNR, UW divers made four detailed reef surveys in 1978 in Lakes Michigan and Superior.

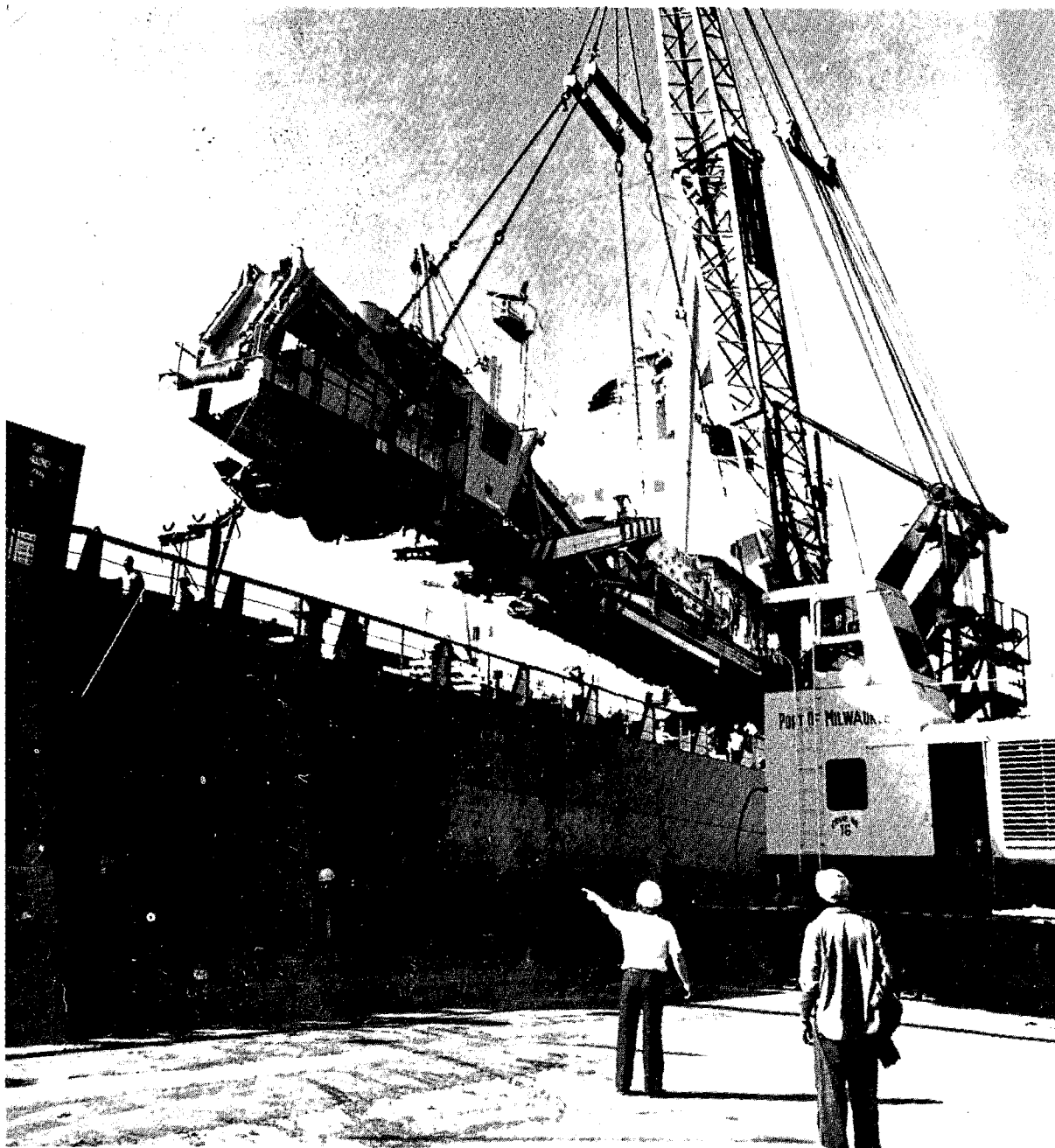
On underwater vehicles, they patrolled over 30 miles of reefs, taking pictures and notes of the reef substrate. They recorded the thickness of rubble beds, size and type of rock, algae cover, silt deposition, number of possible trout egg and fry predators, and depth of water—all factors that could influence the success of spawning trout.

This work, supported by the Wisconsin Coastal Management Program, continued in 1979 with surveys of four new reefs. The goal, says oceanographer J. Phillip Keillor, is to single out those areas where the bottom seems most suitable for trout spawning and egg survival so the DNR can plant fish there.

According to Ron Poff of the DNR Fish Management Bureau, the studies will be used to guide a number of future efforts. When the data has been analyzed, it will help determine where stocking should be focused. Shoals in need of improvement could become targets for sediment cleaning or predator control projects.

And some of the most promising reefs could become the nucleus of refuges, where fishing is restricted to provide a sanctuary for the trout. At the moment, there is only one such sanctuary in Wisconsin's Lake Superior waters.

"These areas are critical to the goal of establishing a self-sustaining trout population," says Poff. "If we can accomplish that goal, we will have re-established an important commercial industry and a popular source of recreation on the coasts."



HARBORS

"The most advanced nations are always those who navigate the most."

R. Emerson, *Society and Solitude: Civilization*

Great Lakes harbors are vital to the historical development of Wisconsin. Immigrants settled at river mouths and in protected bays. Goods from the East passed through growing harbor communities to the agricultural hinterlands of the interior. Remote trading settlements became regional trade and manufacturing centers. More recently, those same harbors burst with an ever-expanding fleet of recreational vessels.

Wisconsin's 23 Great Lakes ports still maintain the tradition of providing water-borne commerce and transportation. The giants—Superior, Milwaukee, Green Bay, Manitowoc, and Kewaunee—are each responsible for shipping at least 500,000 tons annually. But these commercial harbors range widely in activity: Superior ships about 35 million tons of taconite ore, coal, and farm products annually, while small fishing harbors like Cornucopia and Suamico confine their commercial activity to several thousand pounds of fish.

In addition to these commercial harbors, Wisconsin has at least a dozen ports-of-call which cater exclusively to the recreational boater. All told, 47 marinas located throughout the 15 coastal coun-



Wisconsin's commercial harbors want to capture larger shares of midwest shipping

ties have berths for over 3,200 recreational craft, according to a 1977 WCMP study carried out by the UWEX-Recreational Resources Center. By 1980, an estimated 50,000 boaters will use these marinas and an additional 160 boat ramp sites on the average summer weekend day.

In 1966, the former Wisconsin Department of Resource Development noted that "Port and harbor development in Wisconsin will remain a responsibility of local government. There is very little need for intrusion from the state level, aside from providing some advice and assistance to communities who are unable to regularly draw upon such advice and assistance from other sources."

By 1979, the situation has dramatically changed. Harbors are no longer just local issues. Harbor maintenance, planning, and development costs have grown beyond the means of local governments. And the impacts of port activities are state and even region-wide.

Commercial Port Enhancement

Wisconsin's major Great Lakes ports have embarked on programs to capture larger shares of Midwest shipping.

"Our mission for existence," says James Haskell, Deputy Director of the Port of Milwaukee, "is to provide transportation economies for Wisconsin manufacturers. If we can save them money on shipping costs, they can use it for development."

Milwaukee, largest general cargo port in the state, has gauged a substantial interest in their facilities from a recent questionnaire funded by the Wisconsin Coastal Management Program in cooperation with the State Department of Business Development. Haskell is particularly pleased that a number of the favorable responses also came from northern Illinois.

While Milwaukee is looking for new port customers, so are the ports of Green Bay and Superior. Green Bay has recently completed a WCMP-funded study of the use of the harbor area to identify those areas which are particularly suited for heavy industrial use. The study recommended development of the Bay Port industrial park to allow large ships to unload there rather than farther up the Fox River. The improved harbor capabilities should make the port more attractive to shippers or for waterbased industrial development.

The Port of Superior, like Milwaukee, is concentrating on comprehensive planning and advertising to achieve "maximum utilization of the harbor." According to Nick Baker, president of the Superior Board of Harbor Commissioners, they are now implementing recommendations of their harbor land use and management plan.

In addition, Superior has been promoting its advantages through advertising in Duluth, Milwaukee, and Superior newspapers. A recent *Seaway Review* contained a 28-page section of advertisements and articles outlining the advantages of all Wisconsin Great Lakes ports for both domestic and foreign trade.

Milwaukee, in particular, is concentrating on promotion. Besides advertising in national publications, they are updating a port film aimed at ship-

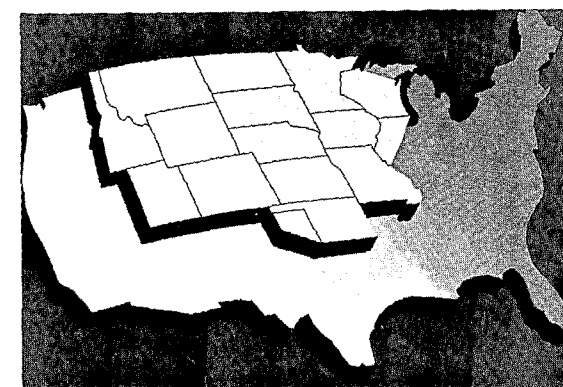
pers and producing printed literature. Through subscription to a statistical service, the port is also able to calculate exactly what shipments would have cost shippers if they had used the Port of Milwaukee.

Already, the WCMP's concern for port enhancement has brought praise. John Seefeldt, Green Bay Port Director notes "Since coastal management got into this area, it's brought funding that was never there before."

Superior Port Director James McCarville agrees. "Due to the efforts of the Coastal Program, for the first time the Port of Superior has the credibility it needs in the city."

One of the most important offshoots of the WCMP's interest in commercial ports was the formation of the Wisconsin Council of Great Lakes Ports. By providing a forum for the port directors of the four major commercial harbors and representatives of the Department of Business Development, the Department of Transportation, and the WCMP, this group has realized coordination—not competition—among the ports.

This cooperation among the ports is viewed as a major accomplishment. "There has never been a



Wisconsin Great Lakes ports serve the interior of the nation

coordinated approach to the problems of Wisconsin's ports," says McCarville.

The Wisconsin Council of Great Lakes Ports has already made its presence known. The Council was one of several strong supporters of the recently enacted legislation which provides for a state financial assistance program for port maintenance and dredging.

Recreational Harbors

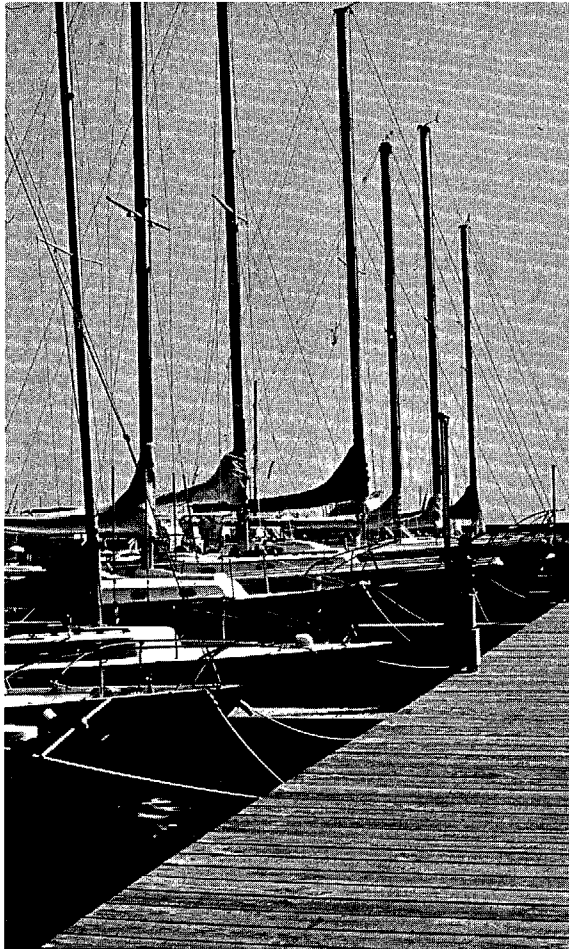
The WCMP has also been interested in the present and future needs of Great Lakes recreational harbors.

Two studies funded by the WCMP explored the situation facing coastal recreational harbors. *Economic Impact and Needs of Wisconsin's Great Lakes Boaters* (1976) documented the demands made by boaters on marinas and boat ramps, as well as boaters' impact on local economies. *Demand and Supply of Recreation* (1977) predicted that between 1970 and 1990 the 15 coastal counties will experience a 200% jump in the number of boaters using the lakes.

The WCMP has also been eager to assist communities where other assistance has not been forthcoming. Local governments received front-end money for planning, which has, in turn, made them eligible for other construction monies.

In 1978-79, the WCMP funded a breakwater improvement study for the South Shore Park area of Milwaukee County; a study of onshore boat harbor and marina facilities needed by the city of Port Washington for their marina development; and the plans for a Breakwater Park for the City of Oconto. Prior WCMP efforts include waterfront plans for Washburn and Ashland.

The WCMP will also help communities assess existing recreational facilities to maximize their use. The City of Racine received a \$15,000 WCMP grant to develop a management plan for its harbor



Over 50,000 Great Lakes boaters crowd the 47 marinas and 160 boat ramps on the average weekend day.

which is now becoming predominantly recreational. Likewise, the City of Kenosha will re-examine its recreational and commercial harbor facilities with a \$26,000 WCMP grant for a Harbor Master Plan. In a parallel effort to make the best use of existing facilities, the WCMP has funded a marina management training program through the UWEX-Recreational Resources Center.

Council Policy Recommendations

In addition to funding harbor projects, the WCMP has also been active in assisting in the development of state policy as it concerns the Great Lakes harbors.

In 1977, the Coastal Management Council supported efforts of the Departments of Transportation and Justice, as well as the Governor's Office, to block abandonment of the cross-Lake Michigan rail and car ferry service.

More recently, the Council urged the Governor to oppose the U.S. Army Corps of Engineers proposal for year-round navigation on the Great Lakes system. While supporting the concept of extending the season for several weeks to facilitate overseas shipments, the Council resolution requested clarification of potential costs to the state, further investigation of environmental impacts, and review of alternative means to increase the navigation capacity of the Great Lakes system.

The latest Coastal Management Council action came in September, 1979 and concerned the issue of harbor dredging. Council attention to the issue began about a year earlier with discussion of various views of state and federal policies regarding dredged material disposal. During the course of Council study, a shift in federal policy was identified and impacts on mid-size and smaller ports were documented.

Final recommendations called for a state agency to coordinate the evaluation, classification, scheduling, and funding of harbor maintenance projects for local governments with the federal government; the identification and approval of on-land or contained sites for disposal of dredged materials; greater federal appropriation to reduce the backlog of maintenance dredging in Wisconsin harbors; and assessment of sand by-passing and beach nourishment techniques.



PUBLIC ACCESS

"The sea doth wash away all human ills"
Euripedes

There are only nine inches of Great Lakes coast for each Wisconsin resident.

Obviously, we are not all interested in visiting the coast at the same time. But existing facilities are often overwhelmed with overflow crowds of those of us who do make the trip.

The shoreline is a very limited resource, and many different activities—economic, historic, natural, recreational, residential, municipal—are all competing for their place on the coast.

All along the Great Lakes, the pressures for new and better recreational facilities are intensifying. Of thirteen coastal communities surveyed in 1977, ten reported overcrowded boating facilities. Seven complained of overtaxed fishing facilities. Between 1970 and 1990, Great Lakes boating is expected to grow by 210 percent, fishing and hiking by about 150 percent, camping by 133 percent, and sightseeing by 115 percent.

Since only 15% of Wisconsin's coasts are currently in public ownership and, therefore accessible for public access, the pressures of increased recreational demands, concerns for equity, and campaigns to upgrade facilities are sure to provide a major coastal challenge for the 1980s.

Kemper Center

Recycling is a method of conserving natural resources and saving energy.

In Kenosha, Wisconsin, a community of involved citizens has expanded the meaning of recycling to include adaption of historic resources and improvement of public recreational access.

Kemper Hall, an internationally known school for girls, closed its doors in 1975, after more than 100 years of operation. The campus, consisting of ten buildings and 11 landscaped acres, was put up for sale. Located on the shore of Lake Michigan, in the City of Kenosha, the site provides a coastal location, tennis courts, playing fields, walkways, and gardens.

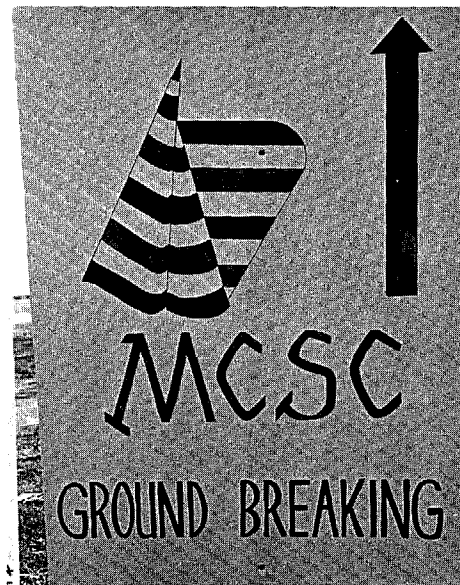
Interested citizens in Kenosha recognized the unique features of the national historic site and decided to recycle Kemper Hall into a public facility. They formed Kemper Center, Incorporated, a non-profit organization whose purpose was to work with local governments towards purchase and development of the site for public benefit.

The Kemper property is now Kenosha County's seventh park, administered for the county by Kemper Center, Inc., since purchase in 1977.

In early 1978, the Kemper organization began its efforts to provide the community with lakefront recreation, cultural activities, and historic preservation—a little bit for everybody—thanks to a grant from the Wisconsin Coastal Management Program. Terri Stepan was hired as a full-time director and immediately involved local community groups. The grant also provided a feasibility study and design for the public fishing pier to be accessible to the elderly and handicapped, as well as long range planning.

Construction of the 150-foot pier should begin in Spring, 1980. The facility will run parallel to the shoreline along part of the Kemper Center's 1,500 feet of Lake Michigan frontage. Nearby will be

Jim Purinton Photos



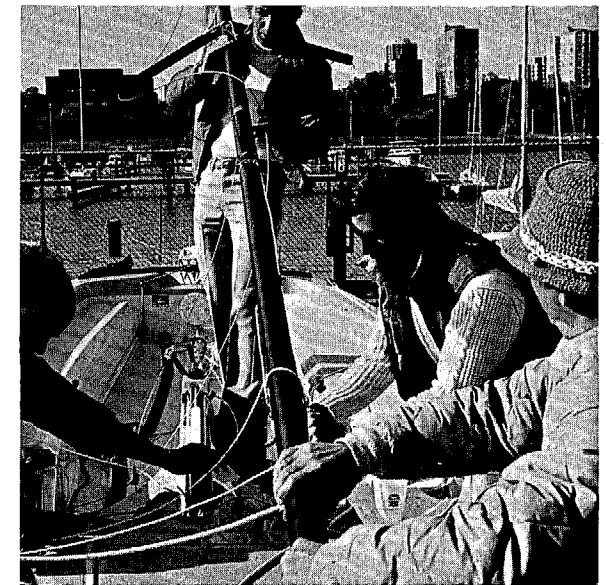
The Milwaukee Community Sailing Center officially broke ground in fall, 1979

parking spaces wide enough to accommodate vans with wheelchair lifts.

Stepan says that other plans include renovation and restoration of the Kemper buildings including the elegant Durkee mansion, built in 1850 as the home of the original owner. They will become a cultural center housing meeting rooms, classrooms, art studios, and museum space. Funds for the work will come from private contributions.

Rather than being just a passive open space, the Kemper Center invites neighborhood participation of all kinds. "We're trying to get involved with as many community groups as possible," states Stepan. Nine local service organizations are actively working on projects.

Already the Kemper project is proving to be a success. It has won two state prizes and wider recognition from the National Association of County Boards. But more importantly, it has enabled the local community to get in touch with their lake-shore in a beautiful setting.



Milwaukee Community Sailing Center

How often does \$6,000 and a good idea lead to over a third of a million dollar investment?

Three years ago, the Wisconsin Coastal Management Council received an inquiry from a coalition of Milwaukee community groups who were interested in increasing middle and lower income participation in Great Lakes recreation—especially sailing. The community groups, brought together by the Mayor's Office, wanted to set up a community sailing center modeled after a successful venture in Boston and similar to ones at college campuses across the nation. Adults could join and sail the boats owned by the non-profit organization.

Youth instruction, perhaps even appealing to the low income and minority kids in close proximity to Milwaukee's waterfront, would be provided for a nominal fee, and would use the boats and equipment at non-peak periods. After initial start-up costs, the center would be self-supporting.

The first roadblock was the perception that sailing was a sport only enjoyed by the well-to-do. The \$6,000 national demonstration project, funded by the Coastal Management Program, refuted that myth, as well as providing basic organizational and planning needs.

Late in the summer of 1976, a pilot sailing instruction program was a huge success. With the assistance of the YWCA, UW-Milwaukee Sailing Club, and the American Red Cross, 132 persons each received 16 hours of land school and on-the-water sailing instruction at the cost of one dollar each. More than 40 had to be turned away. Nearly 40% were from low-income and minority families.

"That was the easy part," says Ted Seaver, President of the Milwaukee Community Sailing Center, Inc. "We still had to go about building a permanent organization, negotiating for a permanent site along Milwaukee's harbor, and then recruiting donations and members so we'd have some boats to sail and some people to sail with."

As the grant ran out, private sources were interested in providing funds for boats and equipment—if a permanent site could be established. A boat show exhibit showed great potential for generating members—once the program was operational. And the county, owner of most of the public recreational lakefront, would consider leasing an area to the MCSC, Inc.—once the group had a successful track record. Catch-22.

A breakthrough finally came with the county. "They agreed to develop a dry sailing facility to help alleviate boat launch ramp congestion in trade for our managing the facility on a lease arrangement," says Seaver. "We would get our facility, and the county could share in its success."

Since then, architect's plans have been drawn, the ground was broken in late October and most importantly, the Milwaukee County Board of Supervisors recently committed funds to complete development of the site.

"Now we're just about ready to go," says Seaver. "The support we've been getting is tremendous." In addition to over \$350,000 in county commitments, donations have already come from the who's who of Milwaukee foundations and interested sailors in law firms, accounting offices, and electrical contracting firms.

"With a little luck, we'll be ready for some activities next summer," Seaver explained. "Know any kids who want to learn to sail?"



Liz Ruskin Photo

Dozens of citizens pitched in to create their lakeshore trail

Washburn Parks and Trail

From Washburn you can get a terrific view of Lake Superior—if you can get to the lakeshore. That used to be a problem in this small Bayfield County community. But now, thanks to the enthusiastic efforts of some Washburn citizens and the Wisconsin Coastal Management Program, getting that view is a lot easier.

A rustic, one-mile hiking trail from West End Park along the lake now gives easy access. Mayor Edith Merila says that the trail makes Washburn feel like the lakefront city it is, not "just a town that could be anywhere."

The trail was a "real community effort," according to Merila. Working from a WCMP-funded plan, local citizens donated materials and pitched in with volunteer labor, constructing footbridges and stairs and clearing the way for the sawdust-covered path. A large part of the credit for directing the work, says Merila, goes to Janice Norlin and William Robinson, but dozens of others donated hours of work.

The recently-completed trail is only one of several waterfront projects receiving widespread community support in Washburn. About a year ago, the city got WCMP funding to hire a full-time park director for what was supposed to be a six-month period. But the park recreation and education program was so successful that the city decided to continue it on a year-round basis.

Another WCMP grant has made possible a new design for West End Park. Plans were recently completed that will emphasize the park's lakeshore character through landscaping and natural vegetation.

At some time in the future, according to Mayor Merila, local citizens hope to be able to extend the lakeside trail another half mile to link it with Memorial Park. The city is also exploring ways to develop a marina. All of these projects are components of the WCMP supported Washburn Waterfront Plan, the official beginning of the community's love affair with its coast.



URBAN WATERFRONTS

*"All the rivers run into the sea;
yet the sea is not full"*

Ecclesiastes 1, 7

Thirty-three incorporated communities dot Wisconsin's Great Lakes coasts.

The shoreline of the typical Wisconsin coastal community is used for many purposes—residential, commercial, industrial, recreational.

Some of the typical community's commercial, industrial, and recreational uses are dependent on the waterfront location. The economic livelihood of 1 % to 96 % of the community's work force is tied directly to the fact that the town is on the Great Lakes. Marinas, boat ramps, beaches and lakefront parks are often congested.

Other uses like homes, restaurants, and lodging facilities also vie for lakeshore locations. Tourism is a large industry for many coastal communities, and the Great Lakes resources are the star attractions.

Natural, physical, and ecological features are also part of the coastal waterfront. Sometimes, these features add to the community's attraction like the hillside setting of Bayfield or Ephraim. Sometimes they provide ecological or environmental func-

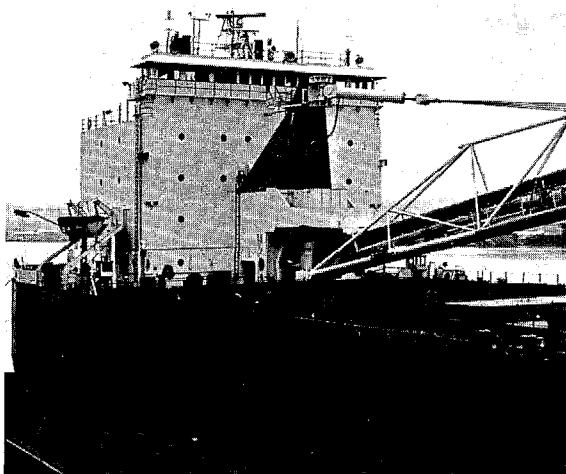
tions, like Green Bay's wetlands. Sometimes they cause concern, like the eroding lakeshore bluffs of many southern Lake Michigan communities.

And there are areas of most Wisconsin coastal waterfronts that are remnants of the past, sometimes to be cherished and preserved as valued historical resources, sometimes to be revitalized and rebuilt to meet tomorrow's needs today.

The challenge facing all Wisconsin communities is the same: Is precious waterfront land being allocated among the competing uses efficiently, fairly, and in the best interest of the community and its future development? Are valuable environmental and historic resources being protected while recreational and economic demands are met?

The waterfronts of Wisconsin's 33 coastal communities are complex and dynamic areas. In all cases, the hedge against future problems—or even disaster—is a plan for balanced growth and protection today.

Bob Halstead Photo



Superior's waterfront includes berths for 1000-foot bulk carriers

Superior

What do you do when you're in Wisconsin's largest port and still growing? When you want to attract more coastal industry but still preserve your sensitive ecological, scenic and recreational resources?

You might start by taking a comprehensive look at your coast, by planning for economic growth and port development where it can best be accommodated, while at the same time ensuring the preservation of your community's recreational and environmental areas. It's a big order, but that's what the City of Superior has done over the past few years with the assistance of the WCMP.

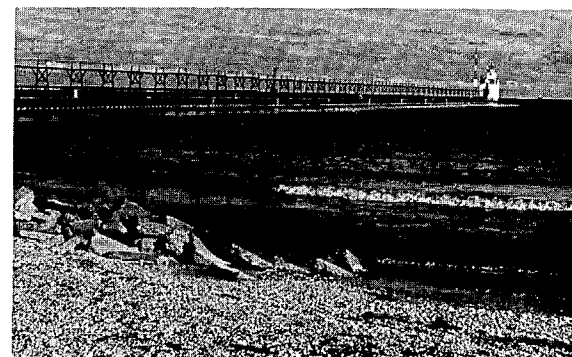
As its first step, the city adopted its part of the Duluth-Superior Harbor Plan, developed by the Metropolitan Interstate Committee with joint funding from the Wisconsin and Minnesota Coastal Management Programs. The city then began upgrading its port development efforts. To this end, Jim McCarville was hired as Port Director.

McCarville is a tireless booster of the harbor's future. "I'm optimistic because I believe in this!" he says. He certainly has reason. Already 45% of all U.S. seaway exports move through Duluth-Superior.

During the past year, four specific areas of the harbor were targeted for further study. Superior is a major Great Lakes port. Last year they shipped a record 7 million tons of grain. Skyrocketing oil prices are turning the city into an ever more important transshipment point for Western coal.

To encourage this development, the WCMP granted the Superior Harbor Commission \$21,937 to promote the effective marketing of waterfront industrial use of the port facilities. The immediate response to this promotion has been positive. A few ads placed in the *Seaway Review* elicited no fewer than 77 inquiries from prospective clients.

Recreational access to the Superior Municipal Forest has always been limited; just a dirt road which is impassable in the winter. With a \$10,000 WCMP



Wisconsin Point natural area in Superior

grant, the city has produced a master plan for the forests long-term recreational development. Included are plans for camping areas, scenic drives, walking, equestrian and snowmobile trails, and an 18-hole golf course.

Despite the scope of the plan, city planner William Lehmann supports gradual development. "Our philosophy is not that these things will be done today or next year, but maybe in 10 or 20 years."

With help from the University of Wisconsin-Superior and a WCMP grant, the city developed a day-use plan for Wisconsin Point which, when implemented, will protect the area's natural vegetation and wildlife.

Some of those damaged resources have already begun to bounce back thanks to the WCMP funded park manager. He was responsible for the placement of a large number of wooden stumps designed to block recreational access to the point. Vegetation is beginning to return to the areas where the posts still stand.

Things are looking up for Wisconsin Point. According to Dr. Rudy Koch of the University of Wisconsin-Superior, "If we can get it restricted to day-use, then we've come a long way."

Likewise, things are looking up for the wise use and protection of Superior's coastal resources.

UW Sea Grant Institute Photo



Algoma is one of several coastal communities looking at its waterfront

Northeastern Wisconsin Communities

Six northeastern Wisconsin cities are taking a hard look at their shoreline management thanks to a total of \$120,933 in grants from the Wisconsin Coastal Management Program. While each project is tailored to the needs of the individual community, they all have in common the desire to improve their coastal management by encouraging conservation and reasonable development.

Sheboygan is developing a plan for the acquisition and management of Pigeon River shorelands from Evergreen Park to the mouth of the river at Lake Michigan. With this, the city will eventually establish a public preserve for the protection of fish, waterfowl, small animals and their natural habitats. The report will define exactly what lands are to be

purchased, determine suitable public access, and establish what city actions will be necessary to carry out these proposals.

The City of Manitowoc is engaged in a study which will contain an inventory of all property ownership and current use, a plan for erosion control, and an outline for public acquisition of environmentally-sensitive areas along the river-front and Lake Michigan shoreline. Acting on these proposals, Manitowoc can expect better management of its public recreation areas and enhanced use of the commercial harbor properties.

In an effort to strengthen its coastal management program, the City of Two Rivers is studying its harbor and lakeshore planning. Of particular interest is the city's attempt to identify and resolve possible conflicts between the active commercial fishing

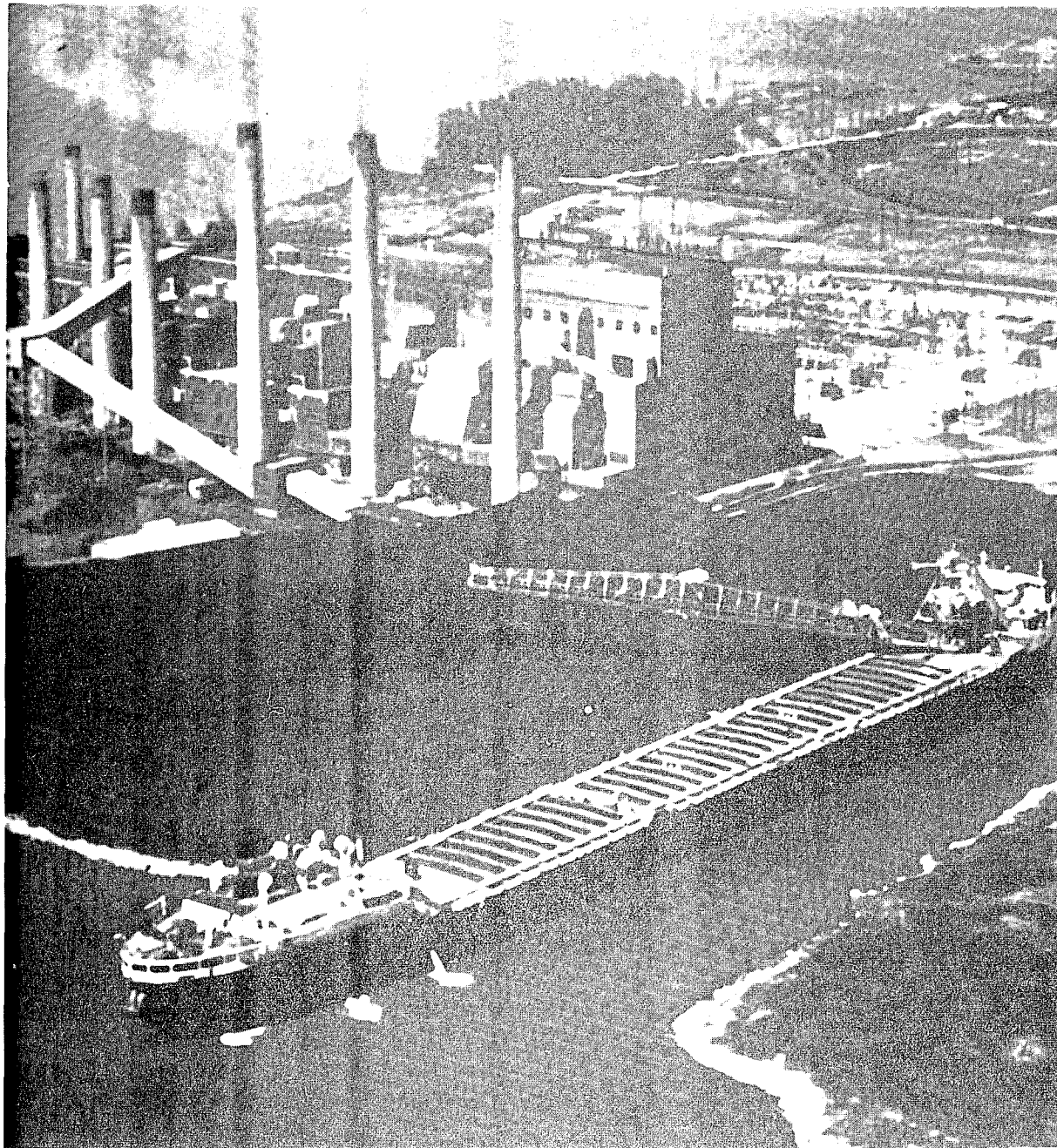
industry and a passive historical fishing village on Rodgers Street. Two Rivers has also completed a plan for all city-owned property adjacent to the lake. According to City Inspector Marvin Now, "Some of these things have been neglected for years. I'm very much impressed with the things we've been able to do."

The City of Oconto has just received designs for a much needed small boat harbor. In addition to improved recreational boating, the new harbor will enhance the support and commercial fishing potential of the area. Included in the plans are a small boat marina, toilet facilities, holding tank dump station, sheet piling, breakwater widening, and road surfacing. Implementation of this design will lead to better use of coastal resources and significantly improved commercial development.

Algoma has just completed a wide-ranging study designed to establish a basic management plan for the city's harbor, increase public access to the lakefront, preserve the historic fishing shanties in the area and establish the necessary ordinances to carry it all out. With such a report in hand, the city has the basis for discussion of rational development of its lakeshore resources.

In a similar move, Sturgeon Bay has just completed a Coastal Management Plan which includes recommended steps for business, residential and recreational development. The study identifies which areas of the city should be the subjects of economic revitalization efforts and offers concrete suggestions on just how each parcel of property should be used.

A plan or a study is basically an expensive piece of paper. By itself, it cannot keep a beach from washing away, or cause a harbor to suddenly appear. But when a community seriously considers the recommendations in a study, a good deal can be done. The information and suggestions in all of these reports will assist each community in making good decisions on the best use of its unique industrial, residential, and coastal environments.



ENERGY

"Destined to be the greatest, the richest, the most prosperous of all the great, rich, and prosperous commonwealths which go to make up the mightiest republic the world has even seen."

T. Roosevelt on the Great Lakes Area

Wisconsin does not possess any known reserves of oil, natural gas, or coal either inland or on the coasts.

Still, Wisconsin's coastal area is important in the state's overall energy picture. Because a shoreline location provides ample cooling water, existing transmission facilities, and the benefits of water-borne transportation, Wisconsin's Great Lakes coasts are attractive sites for energy facilities.

Ten coastal power plants currently provide about 60% of the state's total electrical capacity. Six additional electrical generating units, now on the drawing boards, could increase coastal production by an additional 80% before the late 1980s.

Twenty-seven oil terminals are located in the state's fifteen coastal counties. One refinery in Superior handles Canadian crude. One of three small liquified natural gas storage facilities in the state is within a mile of Lake Michigan. In addition to existing natural gas and petroleum pipelines, a major new pipeline is slated for construction through the Lake Superior coastal counties in 1981.

As eastern utilities increase their use of low-sulfur western coal, existing transshipment facilities will expand and new terminals will be built at Great Lakes port to transfer the cargo from unit train to ship. The Superior terminal, already shipping four million tons per year, plans to double this within the next two years. A new facility has been proposed for Superior and another for Kewaunee on Lake Michigan.

In this day and age of conservation and alternative sources of energy, the coastal area also offers possibilities for both: traditional electrical generation through use of non-traditional fuel processed from solid waste; and solar and wind energy.

Coping with Energy Facility Impacts

How do local government officials assess the impacts of the siting of energy facilities in their community?

A WCMP supported study by the Bay-Lake Regional Planning Commission hopes to find the answer to that question. By focusing in on recent Kewaunee and Sheboygan County case studies, Bay Lake planners hope to assess the process used by local officials when dealing with utilities during the planning and construction phases of an energy facility.

The interaction between local officials and utilities will be examined with an eye to identifying successful methods of conflict resolution. In the end, planners ought to have a fair idea of local officials' capabilities to assess and mitigate energy facility impacts on their communities.

A handbook on energy facilities impacts will also be developed for local officials. In addition to providing a general overview of energy facility siting issues in Wisconsin, the handbook will describe the legal framework for energy facility siting and provide case studies of recent coal and nuclear power plants, transmission lines, coal transshipment, and petroleum storage, and other facilities.



Bob Halstead Photo

Low-sulfur western coal travels through Wisconsin ports to eastern utilities

Resource Recovery

A new 400 megawatt coal-fired power plant is scheduled to begin operation by 1984 in Sheboygan County. Construction and operation of the plant will be accompanied by impacts like increased noise levels and some deterioration of air and water quality.

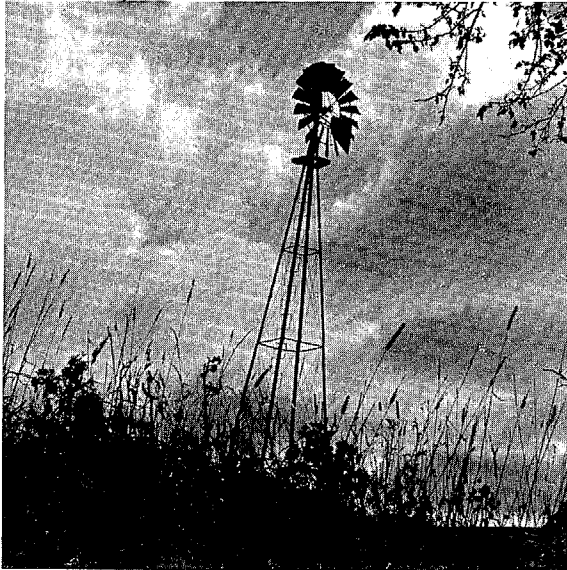
But officials in Sheboygan County are looking to get some positive effects out of the plant's operation as well.

As far back as 1972, studies commissioned by Sheboygan County have recommended a Refuse-Derived Fuel system, accompanied by secondary materials recovery, as a solution to the county's critical solid waste disposal problem. In layman's terms, the county is considering salvaging non-combustible materials like iron, steel, and aluminum from its solid waste and burning the rest to make electricity.

The Sheboygan County Board's decision whether or not to proceed with development of a Refuse-Derived Fuel system hinges upon assessment of the environmental and economic impacts of such a project. Preliminary investigations suggest such a system would offset some of the negative environmental impacts of the plant, and may also provide economic benefits to the county.

At the heart of the study is the cost-benefit analysis of the system from the county's viewpoint. While the county's need for conventional sanitary landfill space would be reduced, the collection, separation, and transportation technologies will require other capital and operational outlays.

If the county is successful in proceeding with its resource recovery plans, area residents will make the most of having electrical generating facilities on their coast.



Wind generated electricity may return to Washington Island

Washington Island Alternative Energy Project

Within the next ten years, you may be able to see modern windmills dotting the landscape and solar collectors on most of the buildings—on Washington Island, Wisconsin.

The Town Board, the Community Action Program Board of Directors, and the Rural Electrification Administration have already set the wheels in motion for a Wisconsin Coastal Management-funded study of the feasibility of a dispersed solar and wind energy system.

Actually, windmills are nothing new to this island located seven miles off the tip of the Door County Peninsula. They provided a considerable portion of the island's electricity prior to initiation of the R.E.A. cooperative in 1945. A recent study of coastal wind patterns has reaffirmed the practicality of wind-powered generation.

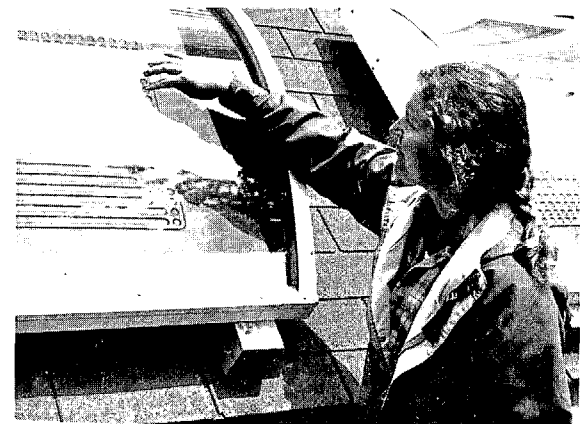
The islanders' interest in wind and solar energy has been generated by increased demand for electricity—especially during the summer peak periods when tourists swell the population to more than 2600—and the spiralling cost of fuel oil which has increased by more than two and a half times since 1973.

Rather than expand their present diesel-powered generators, local residents decided to construct a submarine cable to the mainland and buy electricity from the Wisconsin Public Service Company. But that will still be expensive and inadequate for peak demands. Over the next dozen years, tourism is expected to grow as visitors are attracted to the new Grant Traverse Island State Park, to Washington Island's 17 square miles of undeveloped wilderness, and to its recreation beaches.

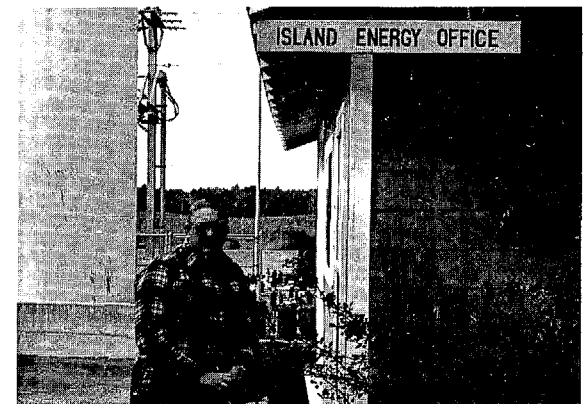
To solve the problem, the residents are turning to wind and solar power. The island's coastal climate, topography, energy demand, and land use and building patterns are ideal for such a system. Over the next 15 months, local officials, with assistance from the State Energy Office, will develop a Wind and Solar Energy Assessment Plan and a Community Conservation Plan.

Before anything can be constructed or recommended, however, further questions must be answered. According to Robert Halstead, State Coastal Energy Impact Program coordinator, planners must know exactly what the wind conditions are, where the best locations for wind machines are, and what type would be most practical and economical. What will people think of the noise and the appearance of the machines? What effects might they have on local insect population and on migrating birds? The impact of solar energy systems will be just as thoroughly studied.

Halstead is excited about the community's response to the project. A great number of the residents are becoming actively involved and will be trained to carry out the studies themselves rather than relying exclusively on outside experts.



The Washington Island project is certain to be of interest throughout the country as a prototype of comprehensive community-wide energy action. "It is one of the most important energy studies in the state," claims Halstead, "because it goes beyond negative impacts of consumption to find a viable energy system." And, it uses readily available, inexpensive coastal resources.



The project also includes solar energy and conservation programs

WCMP PARTICIPANTS

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Emmett Rickaby, Oconto
Bill Skadden, Sturgeon Bay
Marie Sladky, Superior
Cora Stencil, Green Bay
Walter Woelfle, Milwaukee

WCMP PROJECTS

Project (Sponsor)	1978-79	1979-80		
I. Water and Air Quality				
Hydrologic-Water Quality Tools (SEWRPC)	X		Cadastre (Racine Co.)	X
Municipal Water Intakes (DOA)	X		S. Shore Breakwater Study (Milwaukee Co.)	X
Toxic Substances Survey (DNR)		X	Onshore & Marina Facilities (Pt. Washington)	X
II. Natural Areas, Wildlife Habitat, Fisheries			Pigeon River Floodplain (Sheboygan)	X
Green Bay West Shore Wetlands (DNR)	X		River & Lakefront (Manitowoc)	X
Green Bay West Shore Wetlands (BLRPC)		X	Twin River & Lakeshore (Two Rivers)	X
Natural & Scientific Areas (DNR)	X		Coastal Management (Algoma)	X
Woodland Dunes (Manitowoc Co.)	X		Coastal Management (Sturgeon Bay)	X
Wisconsin Point (Superior)	X		Survey and Shoreline Use Plan (Nasawaupee)	X
Bay Beach Sanctuary (Green Bay)		X	Fish Creek Harbor Plan (Gibraltar)	X
Great Lakes Reefs & Shoals (DNR/Sea Grant)	X	X	Southern Green Bay Archaeology (SHSW)	X
Offshore Fish Species (DNR)	X		Breakwater Park (Oconto)	X
Brule River Anadromous Fishery (DNR)	X	X	Red Arrow Park Beach (Marinette)	X
Bad River Fisheries (Bad River Tribe)	X		Regional Physical Develop. Charac. (BLRPC)	X
III. Erosion & Flood Hazards			Montreal River Canyons (Iron Co.)	X
Erosion Plan (UWEX)	X		Saxon Harbor-Flambeau Tr.-Cedar Rd. (Iron Co.)	X
Lake Superior Geotechnical Study (UWEX)	X		Plnr.-Trail-Prentice Pk. (Ashland)	X
Stratigraphy & Geotechnical Study (UW-Madison)		X	Coastal Parks-Trail (Washburn)	X
Erosion Hazard Ordinances (UWEX)		X	City Parks (Bayfield)	X
Shoreland-Floodplain Program (DNR)	X	X	Town Park (Clover)	X
Water Regulation Permits (DNR)	X	X	Town Management Policy (Lakeside)	X
Duck-Trout Creeks (Oneida Tribe)	X	X	Wisconsin Pt. Mgr.-Municip. Forest (Superior)	X
Coastal Parks (Racine Co./Caledonia)	X	X	V. Economic Development	
Coastal Management (Red Cliff Tribe)	X	X	Wisconsin Port Promotion (DBD)	X
Bender to Grant Park (Milwaukee Co.)		X	Port of Milwaukee (Milwaukee)	X
Topo Mapping (Suamico)	X		Port of Superior (Superior)	X
Kenosha Co. Topo (SEWRPC)		X	Port of Green Bay (Brown Co.)	X
IV. Community Development			Foreign Trade Zones (DBD)	X
Resource Professionals Training (UWEX)	X		Highway 13 Corridor (NWRPC/UWEX/DOT)	X
Kemper Center (Kenosha Co.)	X	X	Internal Marina Management (UWEX)	X
Harbor Facilities Plan (Kenosha)		X	VI. Government Interrelationships	
Port Management Plan (Racine/Racine Co.)		X	BLRPC Staff & Task Force (BLRPC)	X
			NWRPC Staff & Task Force (NWRPC)	X
			SEWRPC Staff & Tech. & Cit. Adv. Comm. (SEWRPC)	X
			DNR Liaison & Support (DNR)	X
			WCMP Participation in GLBC & CSO (DOA)	X

VII. Public Involvement

Coastwatch (Racine Co.)	X	X
Green Bay Area Program (Green Bay)	X	X
Magazine Section (DNR)		X
Lake Superior Report (NWRPC)		X
Citizens Advisory Committee (UWEX)	X	X

VIII. Energy Impact

Local Govt. & Energy Fac. Impacts (DOA/BLRPC)	X	
Resource Recovery (Sheboygan Co.)		X
Solar & Wind Energy (DOA/Wash. Is.)		X

PROGRAM BUDGET TOTALS*

	1978-79	1979-80
I. Coastal Water & Air Quality	\$ 40,700	\$135,000
II. Coastal Natural Areas, Wildlife Habitat & Fisheries	276,630	251,100
III. Coastal Erosion & Flood Hazards	285,890	255,740
IV. Coastal Community Development	492,070	208,220
V. Coastal Economic Development	312,150	369,860
VI. Coastal Energy Impact	32,920	100,000
VII. Government Interrelationships	206,900	240,240
VIII. Public Involvement	68,950	124,140
IX. Administration & Council Support	164,600	213,600
	<u>\$1,880,810</u>	<u>\$1,897,950</u>

*Primarily federal funds granted to the WCMP through the Coastal Zone Management Act as administered by the Office of Coastal Zone Management, National Oceanic & Atmospheric Administration; matched with state and local dollars and in-kind contributions.

SPECIAL COASTAL AREAS (SCAs)

Special Coastal Areas contain important natural, scientific, recreational, historic, or economic resources. Local governments and state agencies nominate SCAs for Coastal Management Council consideration. Upon designation, the Council enters into an agreement with the nominating agency to guarantee management of the area according to defined policies.

KENOSHA COUNTY

Chiwaukee Prairie State Scientific Area (DNR)
Kemper Center (Kenosha County)
L. Michigan Shoreline: 44th St. to 61st St. (City of Kenosha)
Alford Pk., Pennoyer Pk., Pike R. Floodplain (City of Kenosha)

RACINE COUNTY

Sander's Pk. Hardwood Forest State Scientific Area (DNR)
Lakeshore & Freshwater Estuary Pks. (City of Racine)
Renack-Polack Woods State Scientific Area (DNR)
Cliffside Pk. & L. Michigan Area (Twn. of Caledonia & Racine County)

MILWAUKEE COUNTY

Lakeshore Pks: Bender, Grant, Warnimont, Sheridan, Bayview, South Shore, Juneau, McKinley, Lake, Big Bay, & Doctors (Milwaukee County)
Milwaukee Harbor: South Harbor Tract (City of Milwaukee)
Submerged Land Along Lakeshore (Milwaukee County)

OZAUKEE COUNTY

Fairy Chasm State Scientific Area (DNR)
Virmond Pk. (Ozaukee County)
Boat Harbor & Marina (City of Port Washington)
Harrington Beach State Park (DNR)

SHEBOYGAN COUNTY

Cedar Grove Ornithological Station and Kohler Pk. Dunes State Scientific Areas (DNR)
Unincorporated Lakeshore Area (Sheboygan County)
City Shoreline (City of Sheboygan)
Pigeon R. Floodplain (City of Sheboygan & Sheboygan County)
Kohler-Andrae State Park (DNR)

MANITOWOC COUNTY Coastal Floodplains, Shoreland, & Conservancy Areas (Manitowoc County)
City Waterfront (City of Manitowoc)
Woodland Dunes (Manitowoc County)
Point Beach Ridges, Wilderness Ridge, & Two Creeks Buried Forest State Scientific Areas (DNR)
Point Beach State Forest (DNR)
Harbor, Lake, & River Fronts (City of Two Rivers)

KEWAUNEE COUNTY Kewaunee Marsh & Little Scarboro Wildlife and Fish Management Areas (DNR)
City Shoreline (Algoma)
Ahnapee State Trail (DNR)

DOOR COUNTY County Park System: Baileys Harbor Ridges, Cave Point, Chaudoir's Dock, Claflin Memorial, Door Bluff, Eastside, Ellison Bluff, Forestville Dam, Frank E. Murphy, Lyle-Harter-Matter Sanctuary, Meridian, Robert LaSalle, & Sugar Creek (Door County)
Fish Creek Harbor (Town of Gibraltar)
Town Shorefront (Town of Nasawaupee)
Schuyler Creek & Strawberry Creek State Fish Management Areas (DNR)
Ridges Sanctuary, Tofts Pt., Conifer Hardwoods, Jackson Harbor, Beech Forest & Cedar Forest State Scientific Areas (DNR)
Mud Lake & Sister Islands State Wildlife and Scientific Areas (DNR)
Gardner Swamp State Wildlife Area (DNR)
Ahnapee State Trail (DNR)
Whitefish Bay Dunes, Peninsula, Potawatomi, Rock Island, & Newport State Parks (DNR)
Reef & Shoal Areas (DNR)

BROWN COUNTY Towns of Scott & Green Bay Shorelands (Brown County)
Cofrin Arboretum (UW-Green Bay)
City Waterfront (City of Green Bay)
Heritage Hill State Park (DNR)
Duck Creek Area (Brown County & Village of Howard)
Duck Creek Area (Oneida Tribe & Brown County)
Town of Suamico Shorefront (Brown County)
Long Tail Point & Sensiba State Wildlife Areas (DNR)

OCONTO COUNTY

City Breakwater & Park (City of Oconto)
Copper Culture Mounds State Park (DNR)
Green Bay Shores & Pensaukee Marsh State Wildlife Area (DNR)
Charles Pond State Wildlife & Scientific Area (DNR)

MARINETTE COUNTY

Red Arrow Pk. (City of Marinette)
Peshtigo State Wildlife Area (DNR)
Little R. State Fish Management Area (DNR)
Seagull Bar State Wildlife and Scientific Area (DNR)

DOUGLAS COUNTY

Harbor & Waterfront (City of Superior)
Brule R. State Pk. (DNR)

BAYFIELD COUNTY

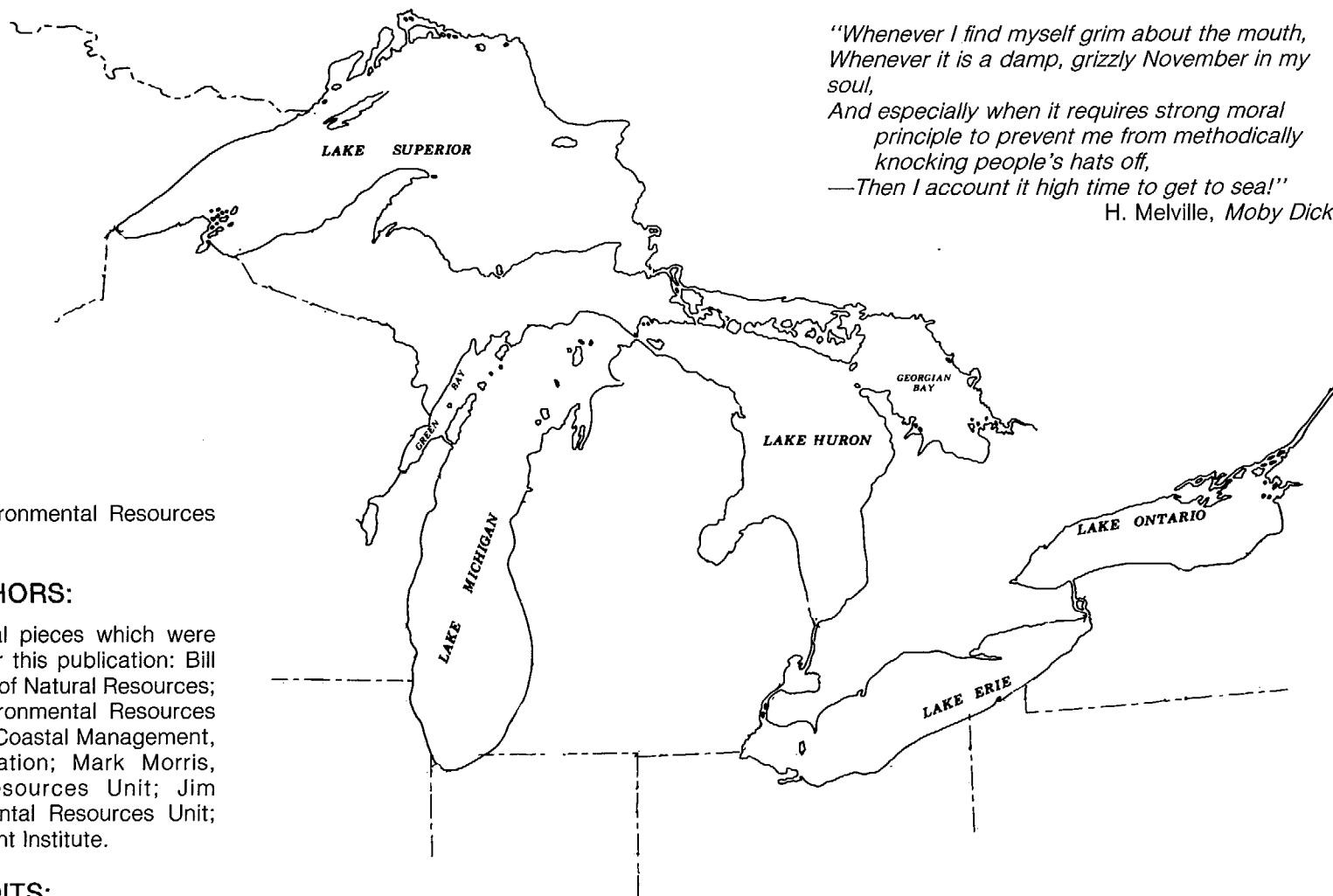
Harbor of Refuge (Town of Port Wing)
Town Pk. (Town of Clover)
Bark Pt. Landing (Town of Clover)
Cornucopia Marina & Park (Town of Bell)
Lost Creek Slough (Town of Bell)
Red Cliff Reservation (Red Cliff Band of the Lake Superior Chippewa)
City Parks: Dalrymple, Bathing Beach, Memorial, & East Pier (City of Bayfield)
City of Bayfield (City of Bayfield)
City Waterfront (City of Washburn)
Fish Creek Slough, Big Sioux R., Bayfield Hatchery, & Lost Creek State Fish Management Areas (DNR)
Lake Superior & Raspberry Bay Public Access (DNR)
Bark Bay State Scientific Area (DNR)
Flag R. State Wildlife & Fish Management Area (DNR)
Reef and Shoal Areas (DNR)

ASHLAND COUNTY

City Waterfront (City of Ashland)
Big Bay State Park (DNR)
Cat Island, Gull Island, & Michigan Island Shoals (DNR)
Sand Cut Fish Refuge (DNR)
Tribal Lands (Bad River Band of the Lake Superior Chippewa)

IRON COUNTY

County Forest North of US 2 (Iron County)
Saxon Harbor Pk. & Marina (Iron County)
Montreal R. Canyons (Iron County)



*"Whenever I find myself grim about the mouth,
Whenever it is a damp, grizzly November in my
soul,
And especially when it requires strong moral
principle to prevent me from methodically
knocking people's hats off,
—Then I account it high time to get to sea!"*
H. Melville, *Moby Dick*

CREDITS

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CONTRIBUTING AUTHORS:

The following wrote original pieces which were used in part or in whole for this publication: Bill Becker, for the Department of Natural Resources; Gail Gawenda, UWEX-Environmental Resources Unit; Helen Ledin, Office of Coastal Management, Department of Administration; Mark Morris, UWEX-Environmental Resources Unit; Jim Purinton, UWEX-Environmental Resources Unit; Linda Weimer, UW Sea Grant Institute.

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Alice Kaufman—front upper right, back lower left

Northwest Regional Planning Commission—front upper middle

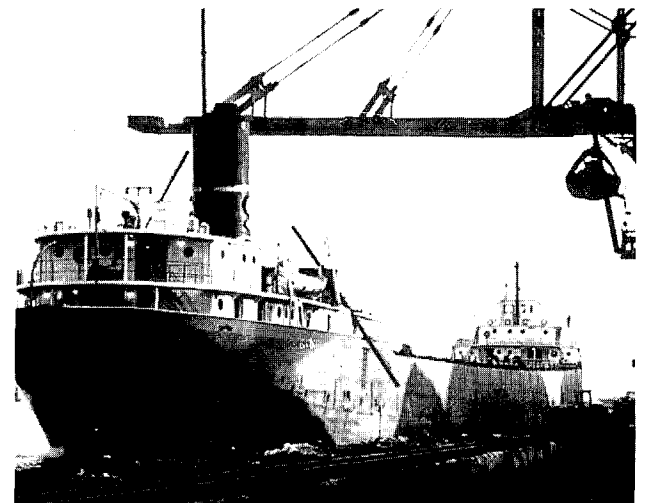
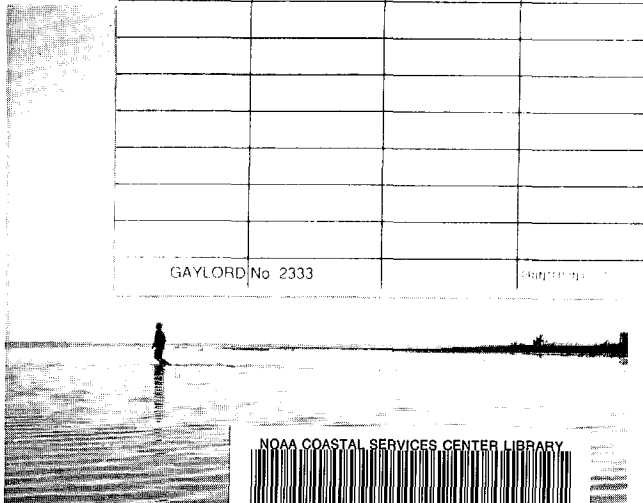
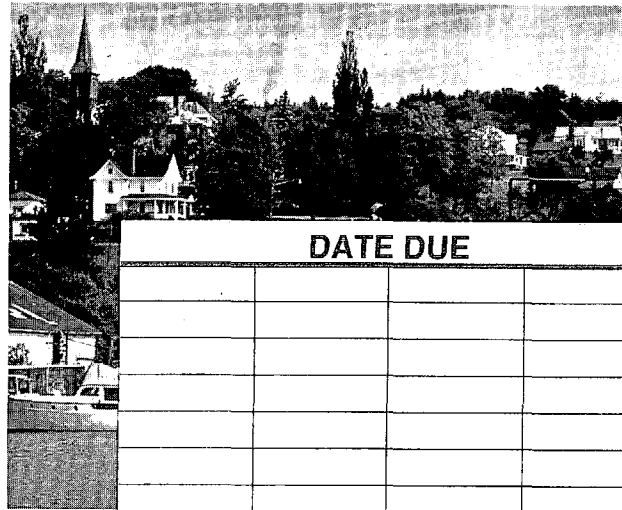
Jim Purinton—front lower middle, back upper left, back lower middle, back upper right

UW Marine Studies Center—front lower right

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